

MODERN METHODS AND TECHNIQUES OF TEACHING



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MODERN METHODS AND TECHNIQUES OF TEACHING

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A REVISION OF AN INTRODUCTION TO TEACHING AND LEARNING

New York • THE MACMILLAN COMPANY • 1948

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Printed in the United States of America

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PREFACE

The purpose of this volume is to present a discussion of modern methods and techniques of teaching in the light of the many changes that have taken place in educational philosophy and practice during recent years. This book was first published under the title, *An Introduction to Teaching and Learning*. It was one of the first books on methods of teaching which discussed teaching and learning as the two major activities of the educative process. Since it appeared, many other books have been published in which a considerable amount of material on how the child learns and on the learning process has been included. After twelve years it appeared that this earlier book should be thoroughly revised and brought up to date.

This book is not intended as a first book in education, but rather as a text to be used in courses entitled "Methods of Teaching" or "Techniques of Teaching." It is intended in its revised form to fill the gap left by those books which have emphasized the experience approach to teaching and have neglected the methods and techniques of learning as of minor importance. It attempts to develop an understanding of the learning process, the basic methods and techniques used by the teacher in directing that process, and the media employed by the child in learning.

The viewpoint of the authors embraces a democratic philosophy of education and an essentially organismic view of the learning process. If, at times, they speak in the language of an earlier view of learning it is because they have failed to qualify their statements properly. In the judgment of the authors, teaching is a pro-

fession quite as demanding in its knowledge of methods and techniques as medicine or engineering. Emphasis on the democratic purposes of education and on learning as an organismic process does not exclude the need for an interest in teaching activities, and in the methods and techniques used by the teacher in accomplishing educational goals. Neither of these considerations is antithetical to the other.

The organization of learning experiences consistent with modern educational goals is the prime consideration of the curriculum worker. In modern schools the teacher develops the curriculum under the guidance of the general principles evolved from modern thought. This book is intended to help the teacher analyze the child's learning and select and use the various methods and techniques which will best promote his growth and development. Since there is a vast amount of detail concerned in the teaching process, the book is necessarily comprehensive.

In its revision this book has been thoroughly reorganized, re-edited, and rewritten to remove errors in the original form and to improve the effectiveness of the organization and presentation. It is hoped that it will prove of increased usefulness to the many schools and colleges which have used it in its original form, and that it will appeal to many new readers who feel the need of a comprehensive discussion of the detailed techniques of teaching and learning. It is believed that the book will be useful also to teachers in service who may wish to refresh themselves on the older techniques as well as to become acquainted with the new ones.

The companion volume, *Directed Study and Observation of Teaching*, should prove of value to persons who believe that the study of teaching and learning should be accompanied by direct contact with practice. This book has been widely used as a guide book for courses in observation of teaching. The content of the present volume is designed to furnish much source material for teachers and students using *Directed Study and Observation of Teaching*.

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Part One

FUNDAMENTAL PRINCIPLES

The principles governing teaching and learning change in response to changes in the philosophy of education and new theories concerning the nature of the learning process. New social theories bring about changes in the ideas of educational leaders regarding the basic principles of teaching. The study of the learning process in the laboratory and the classroom constantly adds to our knowledge of the nature of learning. Biology furnishes its quota of facts concerning the physiological basis of learning. These changes make necessary periodical summaries of fact and restatement of the fundamental principles which are believed to be true as based upon the evidence so far accumulated. In Part One, this textbook attempts to state these changing fundamental principles.

There are important differences in the opinions of different authorities on teaching and learning. In so far as possible, the authors have attempted to select common basic principles of these activities and to develop a working philosophy for them.

The authors conceive of education as a democratic process, the fundamental aim of which is to promote social welfare. Learning is conceived as a complex process of change in the organism brought about by contacts with the environment. The authors are eclectic in their point of view. They believe that it is necessary to preserve the good in the old while making way for the new. Methods and techniques of teaching have a long history. They have changed and will continue to change in response to changing educational theory. It is the purpose of the authors to present the fundamentals of method and technique in the light of changing knowledge and practice.

Chapter I FUNDAMENTAL BASES OF TEACHING AND LEARNING

Teaching and learning are two aspects of a process which we call education. Education is concerned with the development and growth of human beings. The fundamental aims of education in America are democratic. The process of learning is a means of adjusting the human being to his changing world. The means by which this process goes on are both informal and formal. Informal education takes place in the home and in the community as an experience which the individual encounters in the process of living. Formal education is the concern of a democratic school system. These are fundamental hypotheses which guide the thinking of persons concerned with education in America.

In America education is a basic function of the state. The purposes which guide this education are expressed in the Constitution of the United States. The basic philosophy of American education is democratic. It aims to preserve and strengthen human liberties and to secure the common welfare. In its devotion to freedom and free institutions, it is opposed to the domination of the individual, to the welfare of the few as contrasted with the welfare of the many, and to all forms of government which interfere with human rights and liberties.

The basic aims of democratic education are well set forth in such documents as *The Unique Function of Education in American Democracy*¹ and *The Purposes of Education in American Democ-*

¹ Educational Policies Commission, Washington, D. C.: National Education Association, 1937.

racy² of the Educational Policies Commission. These reports represent an attempt to redefine the purposes and functions of education in the light of changing needs. The school is a community agency, the function of which is to promote community welfare through the education of the children and through cooperation with all the community agencies which promote the common welfare.

Education for living in a modern world should not concern itself exclusively with subject matter and the acquisition of knowledge. It should embrace the broad objectives of promoting human welfare in all its phases. These purposes are well stated in *Schools in Small Communities*³ as follows:

Schools in small communities, like educational agencies elsewhere, should provide opportunities for the growth of the individual into effective and constructive membership in society. One of the greatest contributions of educational psychology in the last half century was the recognition of individual differences in all types of characteristics including rates of learning. This, more than anything else, has focused the attention of the school upon the child's interests, abilities, and needs. The chief purpose is no longer the injection of some specific doses of subject matter in all pupils of the same grade, regardless of their experience and ability, but rather in providing "experience consciously designed to create individuals whose values and understanding lead them to cherish a way of life that shows an active desire for the progressive extension of the common concerns of all men." Among other objectives, therefore, will be the full development and continuous improvement of the child's character, physical and mental growth, emotional stability, social judgment, and physical, mental, and occupational efficiency. Thus equipped, young people will be prepared to share, operate, and extend the common concerns that make up the pattern of American democracy.

Such an educational program as is suggested above must concern itself intimately with community life. School life and community life become fused and the school concerns itself with the vital welfare of the community.

In all that comes after in this book the authors assume the democratic purposes of education in America. In a discussion of each specific problem, the intent is consistently to evaluate the methods and techniques of teaching and learning in terms of their democratic values and their agreement with widely recognized psychological principles.

² Educational Policies Commission, Washington, D. C.: National Education Association, 1938.

³ By permission, American Association of School Administrators, Washington, D. C. Copyright, 1939. P. 35.

THE NATURE OF TEACHING

Teaching is the means whereby the experienced members of the group guide the immature and infant members in their adjustment to life. In the animal world, in which the infants are often surprisingly mature when born, such teaching as is done by the adult members of the species is very brief and simple. In human society, the immaturity of the newborn makes it necessary that a long period of education be undergone. From fourteen to twenty years of formal education guided by experienced and trained teachers is necessary for the child in order that he may make his adjustments to life and be trusted to conduct himself as a self-sustaining individual, who is equipped to be of use to himself and to the group in which he lives. The minimum set by law of parental and institutional guidance of the young in America places the threshold of maturity at eighteen years for the female and twenty-one years for the male. During this period formal teaching takes place; afterward the modifications in the individual are the results of life experience. Formal teaching stops, but learning goes on until the nervous system of the individual becomes so unresponsive that further modification of behavior ceases.

Teaching is the means whereby society trains the young in a selected environment as quickly as possible to adjust themselves to the world in which they live. In primitive societies this adjustment means conformity with things as they are. In more advanced civilizations, such as ours, effort is made not only to adjust to things as they are but also to make an advance in the improvement of conditions of life by training the young in modes of thinking and acting which will help to improve the conditions of living that surround them.

Teaching is carried on by parents, brothers, sisters, churches, policemen, magistrates, public lecturers and others as well as by teachers. Some of the most effective teaching is that which occurs before the child enters school; hence the present rise of interest in the nursery school, in the kindergarten, and in parental education. Language is learned in the preschool period, and attitudes, ideals, habits, and certain fundamental abilities needed in social adjustment are developed to a surprising degree before the child enters school and begins formal education. The mother is probably the

most important teacher of the child up to the time of formal school entrance, although his education is truly a cooperative affair distributed among grandparents, parents, aunts, uncles, older brothers and sisters, and playmates. In advantageous situations, this pre-school training is of inestimable worth and prepares the child naturally for the formal education of the school. In other environments, the training or lack of training results in wrong types of development, which seriously retard the child and result in his being a problem case when he enters school.

Formal Teaching and the Standing of Teachers. Formal teaching, as carried on by the school, is a responsibility delegated by parents through the state to specially selected representatives of society known as teachers. This special group has existed for a long time. At times it has been highly regarded as made up of the wise men of its generation. At others it has been scarcely more esteemed than the skilled artisan or upper servant in the home. Efforts are being made today to lift teaching to the status of a profession. To this end, normal schools, colleges of education, and teachers' colleges are being more and more widely developed.

Organized teaching is systematic instruction of the young in a selected environment known as the school. In some communities this environment is hardly better than the community in which it exists; but in most cases, the school brings the child into contact with an organized way of life, specially prepared for children and involving contact with selected experiences of the race which are believed of worth in educating the child for his place in the adult world.

Theories of Teaching. Different theories of the nature of teaching have dominated the educational world from time to time. The view of education as preparation for adult life prevailed for a long period. Recently it has been changing under the influence of a democratic philosophy of education which insists that education is not merely preparation for adult life and that the best type of education for the young is that which best meets their needs at each particular stage of their development. This philosophy also insists that the child must be active in learning and that the time-honored principle of "pouring in" information and repressing the childish impulses to action is fundamentally wrong. The child-centered school is one in which the emphasis is upon activities meaningful to the child here and now. In such a school, teaching becomes a

process of organizing the school environment so that in it children plan, purpose, collect, organize, assimilate, report, reproduce, create, and achieve outcomes natural and valuable to them. Their studies include contact with subject matter of the formal type, but all their experiences are regarded as subject matter. In such a school the teacher is concerned with the significance and quality of the present experience as well as with the development of attitudes, ideas, skills, habits, and appreciations of significance in later life.

The most promising results from the application of this theory seem to the authors to be in the development of the unit of work in the social studies. The least promising are those concerned with the development of fundamental skills—reading, language, writing, numbers, and certain technical aspects of art, music, and industrial art. Wrightstone,⁴ in his appraisal of practices in newer elementary schools, acknowledges that his data do not warrant comprehensive conclusions with respect to the superiority of progressive schools in the fundamental skills. The wide variety of practices among progressive schools in the teaching of skills also makes it difficult to measure experimentally the extent to which those schools use direct methods in the development of skills in reading, language, and arithmetic. With respect to the other advantages of experimental schools, the evidence is much more convincing.

Teaching as a Skilled Occupation. Teaching, since it is a specially delegated function, is or should be a skilled occupation, if not a profession. Skill in teaching implies an understanding of the fundamental aims of education and a thorough familiarity with organized fields of knowledge in general, as well as special knowledge in some particular field or fields. In the United States the practice of allowing teaching to be done by immature and poorly trained individuals delayed its development as a skilled occupation. In recent years, however, requirements for entrance into the profession have been raised in all parts of the country; a strong organization of teachers nationwide in scope has been developed; and state and local organizations have enlarged in number and improved in character.

In addition to adequate knowledge of subject matter, teaching requires instruction in organization for teaching, in the management of teaching situations, and in both general and special techniques which are not acquired from general education and which

⁴ Wrightstone, J. Wayne, *Appraisal of Newer Elementary School Practices*. New York: Teachers College, Columbia University, 1938. P. 205.

must be studied and practiced before they can be mastered. These latter techniques are the subject matter of Part III in this book. To become a good teacher, the student must not only have a special aptitude for teaching and an inclination for it, a good general education, and specialization in some field, but must also spend some time as a student teacher in a practice school learning the methods and techniques which are now known to be necessary in order to teach well. That there are many persons who in the past did not undergo this initiation to the profession does not mean that such experience is unnecessary. Certainly one might learn to teach through trial and success, just as medical doctors once learned medicine through reading with and assisting a licensed practitioner. But no doctor of medicine is allowed to enter his profession through this door at the present time. It is only a matter of time until the profession of teaching will cease being a temporary occupation carried on by persons who themselves are only partly educated. A college education is rapidly becoming regarded as a *sine qua non* for all teachers. A low threshold of admittance to the teaching profession cheapens the standing of the profession among people in general.

Teaching an Art Based upon Science. Teaching is an art based upon a growing science of education. This science is young and has developed during the past half century. It includes the field of educational and experimental psychology. It draws freely from other fields, particularly biology, sociology, history, and philosophy, for its special subject matter. It is a service science in that its objective is to study the development of children through normative, genetic, case-study, case-history, and experimental methods, and to learn by investigation all that it can concerning the most effective means of improving school administration and teaching, including school finance, school planning, organization and management, curriculum-making, methods of teaching and learning, and measurement. It touches all fields of human knowledge and attempts to discover ways and means of organizing these fields for the especial benefit of growing children. While adult education is of increasing importance, and while it is the growing conviction of many persons that education as a function of the state should continue in adult life, education as now organized is concerned primarily with the young.

The scientific aspects of education have developed out of the dissatisfaction of many persons with the time-honored authorita-

tive view, with its unsubstantiated objectives, its conflicting views of the nature of the learning process, and its different methods, devices, organizations, etc., all varying in principle and all laying claim to the highest excellence. The science of education aims to improve teaching; indeed, it has already done so to a marked extent, through subjecting objectives, subject matter, and method to appraisal under controlled conditions and thus proving or disproving conflicting claims. The results of scientific studies of education are tremendously significant for teaching and promise many improvements in the teaching art.

It is well to recognize, however, that as an art teaching is very old and that it must be learned from many sources. Much can be gained from the study of the work of the great teachers of the past as well as from the great thinkers of the present who advance new theories or remake old ones. But teaching as an art is subject to the same laws as other arts. Just as chemistry has improved the artist's colors, so the scientific study of teaching will improve teaching; just as the artist himself will advance his own technique through study of the new data produced by science, so will the teacher improve his art through the data developed by research in education and psychology and through the adoption of better techniques derived from experiment in laboratory and classroom.

Teaching a Form of Social Service. Teaching is one of the most exalted forms of social service. The teacher as a servant of society is entrusted with the development of the most helpless of beings, the human young, the most easily influenced of all creatures and most important for the maintenance of society as it is and for any future advances that may be made. The opportunities of the teacher for good or evil are boundless. For this reason, society has insisted that teachers be known for their high character, their honesty, integrity, and virtue as well as for their knowledge and skill. To have it otherwise is unthinkable. The influence of the teacher's personality and character upon his pupils is incalculable. Character education is impossible without teachers of high character, high ideals, good conduct, and sincerity of purpose. There must be, as well, a sincere love of children and a devotion to their welfare. The teacher must be a likeable human being, a humanist in the true sense of the word; for it is this human quality, the quality of sympathy with and understanding of children, that will be most effective in teaching. Without this quality a teacher can never be

much better than an expounder of words, an actor mumbling meaningless lines without giving life to the play through intense reliving of the words and intense desire to affect the audience. The high quality of the social service demanded of teaching requires men and women of high ideals, engaging personalities, and of sincere and noble purpose. It is only from such that humanity may realize adequate returns on its investment in schools and teaching.

The Study of Teaching. The nature of teaching demands that persons who wish to be teachers shall make a serious study of the art. It has its history. There are classics based upon teaching and upon great teachers. The importance of teaching requires that a study be made not only of its history and philosophy, but also of its fundamental techniques and of its current practices. Without this study, the novice will fail to get a true understanding of what teaching means and will be unable to obtain from the practice of teaching the supreme satisfaction which it gives to persons most devoted to it.

Such a study of teaching should include an introduction to education in its larger aspects, in order that the student may know how to choose a field for study. Either concurrently or immediately following, a study of the nature of learning should be undertaken in order that the student may appreciate the function of teaching and how it may accomplish its function. This experience should be followed shortly by an introduction to the techniques of teaching and learning, with abundant observation of "in school situations" and with as wide reading as possible of the literature of teaching on the more technical side. General preparation should then be supplemented by practice teaching and more careful study of special methods and techniques which the teacher is to use in his profession. It goes without saying, of course, that parallel with this study of teaching should go a study of the major fields in which the teacher wishes to practice.

The study of teaching should be conducted under the guidance of ably trained instructors, masters of analysis, and thorough judges of good teaching in all its aspects. Such study should be continued until the student has assimilated at least the basic principles of the art.

It cannot be expected that in the pre-service period a prospective teacher will master the art of teaching. Years of experience are essential to a complete mastery of this difficult art.

PRINCIPLES OF GOOD TEACHING

Good teaching is characterized by the observance of certain basic principles which it will be the function of this section to enumerate and discuss.

Good Teaching Involves Skill in Guiding Learning. Teaching is not merely a process of imparting knowledge to students nor of curbing undesirable traits and tendencies. In the process of teaching, knowledge is imparted and undesirable traits and tendencies are curbed, but good teaching consists primarily of guiding and directing the pupil and encouraging him toward effort in learning. This guidance is done by suggestions rather than by command, and by the creation of situations which naturally lead to desired types of activity. Good teaching opens up fields for investigation, it introduces new materials, it suggests methods of procedure, and it aids the individual to estimate his progress. Skilled teaching is a guided tour through the world of experience; the teacher is the courier but the excursion fails unless the pupils constitute a band of travelers into new territories anxious not to miss the sights. As a skilled courier, the teacher knows how to make the excursion seem worth the taking, for, after all, the excursion is a failure unless the pupils enjoy it. Guidance is essential at all stages of the journey: first, in setting up the objectives and making the plans; second, in furnishing the means of making the journey; third, in pointing out the objects of interest; fourth, in making these objects meaningful; fifth, in taking care of the physical welfare and comfort of the travelers; and finally in helping them to evaluate the experience so that they will wish to take the same or a similar journey again.

Good Teaching Is Kindly and Sympathetic. Good teaching cannot take place in a situation that lacks kindness and sympathy with the interests and needs of pupils. The good teacher is well disposed toward his pupils, the backward as well as the brilliant. He knows that they are immature and that they need his sympathy and help. Therefore he attempts to create an atmosphere in his school which will seem homelike and pleasant. He avoids scolding and haggling. He attempts to have his organization run by virtue of its own intrinsic soundness and meaning for children. He knows that children must play as well as work; he realizes that his attitude and his personality will affect the pupils' temperaments in various ways.

He seeks, therefore, to understand each child and to develop the teaching situation so that children will feel that the school is a good place in which to be and that the teacher is a kindly person who knows all about children. This does not mean that he will allow children to have their own way continually and to run his school into disaster. He knows that children like to have neatness and good order and that they are happy when they have plenty of suitable activities. Accordingly, he will plan his work most carefully in order to keep children healthily busy at worthwhile things.

Good Teaching Is Well Planned. The good teacher has thought out his problem carefully in advance. He has made due allowances for the necessity of change but he has the main features of his activity well planned. If he is teaching a lesson in social studies, he has the main topics in mind; if the period is to be a practice period, he has abundant practice materials at hand. If he is directing an activity, he has a general view of the terrain ahead. The order and sequence of events is clearly in mind and provisions have been thought out for the management of the whole situation. At the same time, this plan is flexible enough so that it may be changed as need arises.

Good Teaching Is Cooperative. One who aspires to be a good teacher knows that teaching is a cooperative affair between teacher and pupils. He has planned, therefore, to give the pupils abundant opportunity for cooperation in organization, management, participation in discussion, recitation, and evaluation of results. He knows that if he does all the talking, he must have a good excuse for doing so, and that it is generally preferable to plan for much activity on the part of the children and to utilize their help in every way. In the classroom of such a teacher as here described, abundant activity among the children will be the rule.

Good Teaching Is Suggestive. Good teaching proceeds on the basis of suggestion rather than dictation. The military spirit is not the most advantageous for the well-conducted classroom. The teacher leads by virtue of his demonstrated power in leadership. This does not mean that pupils do not respect his authority and that at times he does not need to insist on courtesy, industry, responsibility, perseverance, and the like; it means that on the whole, the good teacher secures the operation of these traits through the creation of situations in which they naturally develop. The teacher suggests activities; he suggests aims, materials, and modes of response. Sug-

gestion has the effect of provoking courteous response and inviting cooperation.

Good Teaching Is Democratic. Good teaching attempts to create a democratic environment in which the rights of individuals are respected. In this environment the teacher proceeds on the theory that each individual is entitled to equal rights with every other individual in the class and that he is subject to the same rules with respect to social equality as the pupils. Therefore good teaching does not encourage subservience on the part of the pupils but rather confidence within each individual that socially he is the equal of his peers. Little John Henry Smith III is no better in the democratic classroom than Johnny Smith, the son of the junkman, but is entitled to participate in the activities of the school on the same basis. Further, both John Henry Smith III and Johnny Smith are entitled to participate with the teacher in a democratic organization in which each has his part but must also respect the rights of others.

The implications of democracy for teaching are, of course, much broader than respect for the personality of the pupil. Democracy demands responsibility of its members for service to the group welfare. It means the giving of service as well as the receiving of rights and privileges. It expresses itself in innumerable ways in the daily work of pupil and teacher together, in the determination of purpose, the selection of ways and means, the faithful discharge of duties, and in the appraisal of outcomes. It is both an attitude of the mind and a method of work.

Good Teaching is Stimulating. The emphasis placed upon pupil activity in the modern school sometimes seems to suggest that the teacher shall be a vague and formless personality in the classroom or a Banquo's ghost at the feast. That is far from the truth. The good teacher stimulates through his personality and his activities the personalities and activities of the pupils. The school environment is a selected environment, and the activities are directed. This means that the good teacher stimulates through teaching, through suggestion of new activities, through criticism and direct suggestion. His duty of leadership is not decreased but rather enlarged by the fact that he must think not only of his own activities but of the encouragement of the pupils to activity. He stimulates purposing and planning, collecting and organizing, reciting and discussion, evaluating and using, making and building, practicing and memo-

riking, as such activities need furthering and directing. Without the stimulating personality of a competent teacher a classroom would soon be a disorganized and ineffective agency for childhood education.

Good Teaching Takes into Account the Past Experiences of the Children. The expert teacher recognizes that education is in its best sense the reorganizing of experience. It is necessary, therefore, in proposing any new activity, to take into account the interests, attitudes, skills, and habits of children. It is also necessary to take into consideration the experiences of the teacher in previous contacts with the children, a consideration of proved and tried modes of procedure and of results previously obtained. While open-mindedness as to new possibilities is characteristic of good teaching, this cannot mean that the teacher should put behind him in each new situation that which he has learned in the old. There are general modes of procedure and tried and proved activities which enable the teacher to avoid errors in the new and which insure that the results of each new experience will be achieved more effectively than those of the preceding. Likewise, successes in the previous activities of children suggest ways of making new activities effective; past experience is necessary in both teaching and learning.

Good Teaching Is Progressive. Satisfaction with past achievements and contentment with a static situation do not characterize good teaching. The good teacher is highly concerned with the progress of children in the achievement of attitudes and interests, ideas and information, skills and abilities, and the development of habits of thought and action which lead toward desirable social goals. Unless the teacher is working toward goals which are regarded as likely to improve present social conditions, he lacks orientation as to the true meaning of education. Progress is aimed toward an improved way of life for all the people living in a democracy.

Likewise, good teaching is never satisfied with its modes of procedure but is ever looking forward to their improvement. The teacher must make progress in methods and techniques of accomplishing the social goals of education. It is not enough merely to give lip service to these aims. The teacher must grow in skill and technique as well as in the improvement of goals.

When teaching improves steadily, it is progressive. Progressiveness is a relative term and there are all degrees of progressiveness in American education, ranging from situations in which no prog-

ress is made at all—absolute zero—to those in which the leaders are so far ahead of the masses that they are hardly within hailing distance. The wise teacher is as progressive as the situation will permit him to be. This situation includes the parents, administrative superiors, and the community as well as the children under his charge. Some situations allow faster progress than others. The wise teacher will gauge his rate of progress to the situation in which he teaches, but will never give up the desire to teach better as time goes on.

Good Teaching Diagnoses Difficulties. Good teachers have always had a wary eye for the learning difficulties of children. In recent years the development of measuring instruments has made possible better diagnoses of children's difficulties. It is true that diagnoses of difficulties in reading, spelling, writing, language, and arithmetic are rather more advanced than in social studies, science, literature, and other fields, but even here good teachers are much more sensitive to the need of individual instruction than ever before. Some are even learning to use the case method in the study of individual children. There is much hope for increasing skill on the part of teachers in discovering and remedying the learning difficulties of children.

Good Teaching Is Remedial. It follows from the preceding principle that good teaching must provide remedies for individual as well as for group difficulties. Skill in remedial work demands not only a broad general view of the problems of learning involved in a teaching situation, but acquaintance with a variety of devices and techniques for remedial work in the different school subjects. Remedial work is particularly important in subjects where skills are involved in which the failure to master one step prevents making progress in the next. Numerous case studies of children retarded in reading and language indicate that much retardation in learning could be prevented if teachers would diagnose difficulties and apply remedial procedures when the need arises rather than to pass them over unnoticed.

Good Teaching Liberates the Learner. The ideal of good teaching is to develop initiative, independence in thought and method of procedure, self-reliance and confidence among pupils so that eventually they will be able to attack their problems independently and work out solutions. Independent habits of study and achievements in work among pupils testify to good teaching. That type of teaching which dictates the child's every move and which makes no pro-

vision for a gradual diminishing of guidance is not desirable, for good teaching liberates the mind through the development of sound habits of thought and action and the perfection of skills and abilities needed in effective work. The ideal of good teachers is to liberate the child from teaching.

THE NATURE OF LEARNING

As educators interested mainly in the promotion of the learning process, the authors are not concerned here with theoretical psychology. They are not concerned with the controversies among the different schools of psychological thought, but rather with the common agreements among these schools which seem to offer the basis for working principles that may be used in guiding the learning process. It does not seem essential in this discussion, therefore, that the authors identify themselves with either connectionism, conditioning, or with the field theory of learning. They believe that the theoretical explanations of learning have much in common and that each of the theoretical systems makes important contributions to an understanding of the learning process which is so fundamental to teachers and teaching.⁵ It is to these common agreements that the authors turn in an effort to develop a working understanding of learning.

Older Views of Learning. It was formerly conceived that the child, a pliable organism with great potentialities for receiving impressions from without through the sense mechanisms, was chiefly to be taught as a passive recipient of verbal and visual impressions. Learning proceeded by means of teaching exercises in which the teacher was an expounder, a drillmaster, and a disciplinarian. The child's part was to listen, observe, memorize, and repeat accurately what he had learned. Skill in reading was achieved through phonic exercises divorced from context. In a similar manner history was learned through reading, memorizing, and repeating the textbook or memorizing the oral words of the teacher. The law of use was a constant factor and almost the sole reliance of the teacher in causing the child to learn. It was assumed that the natural inclinations of the child were against learning such facts, appreciations, and skills as the school thought important, and that subject matter and

⁵ See "Psychology of Learning," Forty-first Yearbook, Part II, National Society for the Study of Education, p. 3; also Chapter VII, pp. 243-283.

the child as such resided in two different worlds which must be bridged by such devices as preparation and presentation, extrinsic motivation, and the like. The intermediary factor between the child and the subject which was used as a means of forcing the child to learn was discipline. If enough pressure was brought to bear in the way of repetitions of the same type, and if enough dissatisfaction arose from the pain endured as a result of failure to learn, the child gradually became disciplined and docile, applied his will to learning, and became able eventually to recite the words of the textbook, write the hand of a master penman, spell long lists of meaningless words, solve arithmetic puzzles of no practical significance, and otherwise perform prodigies of aural, visual, and motor activity which somehow or other prepared him for adult life. Education was a long and painful process of preparation, and learning was not accessible by any royal road.

Newer Views. Advances in the study of children and the learning process in the past half century have developed newer views of the nature of learning. At least three major schools of psychological thought, prominent at present, give different explanations of the learning process. They are: (a) conditioning; (b) connectionism; and (c) the field theories. Each of these theories gives a somewhat different explanation of the learning process, but they all have certain elements in common. From the studies of these groups there is slowly emerging more and more agreement, which raises the hope that eventually they may develop fundamental principles governing learning in general as well as specific principles regarding certain types of learning studied chiefly by these schools of thought. Much of the literature which discusses the differences in the theories of these schools is confusing and has little practical significance to the classroom teacher.

There are, however, certain agreements among these schools which, as pointed out by McConnell,⁶ have practical significance to the teacher and the educator. These principles we shall paraphrase freely from McConnell's discussion.

1. (By inference from an analysis of McConnell's chapter.) Learning consists of modifications in the behavior of a living or-

⁶ McConnell, T. R., "Reconciliation of Learning Theories," Forty-first Yearbook, Part II, National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Co., 1942. Chapter VII, pp. 243-286. By permission of the National Society for the Study of Education.

ganism that result from contact with the environment through the sense organs.

2. "What behavior will occur when an organism learns is a function both of the nature of the organism and the character of the situation which evokes the learning."⁷

3. "Learning situations . . . differ in the extent to which the subjects must discover the correct response."⁸ Most learning situations require some degree of discovery of the correct response to the situation by the learner. This indicates that learning is not a mere mechanical response to a specific stimulus in the environment but requires analysis and selection on the part of the learner.

4. "The difficulty of the task determines in part the characteristic features of the learning."⁹ When a task is easy, learning progresses rapidly; a difficult task slows down the rate of learning.

5. "The tasks to be learned may vary from those which possess very little structure to those that are highly organized. . . . If the learner discerns the scheme of a structured series he will almost certainly learn it more quickly than he will an unformed series."¹⁰ In other words, it is easier to learn meaningful than meaningless material. In the learning of meaningful material the learner will also use different procedures than in the learning of meaningless or unorganized items.

6. The tasks to be learned in the school vary greatly in meaningful organization.¹¹ This means that not all learning in the school can be approached in the same fashion. There are some things to be learned that are not necessarily highly meaningful to the learner at the time, but which must nevertheless be learned.

7. "The factor of organization in learning situations can be controlled to a considerable extent."¹² This makes it possible for the school to present situations particularly favorable for learning and to aid the learner to proceed more economically and quickly than he would without guidance.

8. "Descriptions of how a human being learns vary with the task and the nature of the observations made."¹³ This principle

⁷ *Ibid.*, p. 245.

⁸ *Ibid.*, p. 243.

⁹ *Ibid.*, p. 245.

¹⁰ *Ibid.*, p. 246.

¹¹ *Ibid.*, p. 248.

¹² *Ibid.*, p. 249.

¹³ *Ibid.*, p. 249.

accounts for differences in the descriptions of different types of learning and makes possible broader descriptions of learning than those which could be given if it were assumed that all learning is exactly of the same type.

9. "*Trial and error* and *insight* both roughly describe certain phases of the learning process and fail to describe others."¹⁴ These two descriptions of learning are not different in kind but are complementary to each other. They represent extremes in a continuum rather than disparate parts of a discontinuous order. This principle explains the presence of both trial and error and insight in learning and allows for the role of intelligence in the learning process.

10. The importance of goals, purposes, wholes, parts, etc., are implied in all explanations of the learning process.¹⁵ Instead of there being marked differences in theory as to the role of purpose and the significance of meaning in learning, there is only some difference in the description of the significance of these factors among the different theorists.

11. "Both integration and differentiation occur in human growth and in human learning."¹⁶ This denies the idea that integration is the whole of learning. It is essential to see likenesses, but differences also must be distinguished. Analysis as well as synthesis is essential in learning. The nonessential must be discarded as the essential must be retained.

12. Symbolic, emotional, and social behavior are interdependent.¹⁷ In other words, verbal learning, which is symbolic, is related to emotional learning and to the learning of social adjustments, instead of being foreign or opposed to them. This makes possible a broader interpretation of learning in school where much that is verbal is essential to progress in learning.

13. "For the time being we cannot reduce all cases of learning to a few principles, even though that may be ultimately possible, but must retain a fairly extensive set of principles to cover a wide variety of situations."¹⁸ This makes valid the discussion of principles of associative learning, motor learning, and the like in Part II of this volume.

14. "Both situation and response are complex and patterned

¹⁴ *Ibid.*, p. 251.

¹⁵ *Ibid.*, p. 253.

¹⁶ *Ibid.*, p. 254.

¹⁷ *Ibid.*, p. 254.

¹⁸ *Ibid.*, p. 256.

phenomena.”¹⁹ The mechanistic theory of S-R, so much criticized in recent years, is really nonexistent. Even those accused of holding this theory recognize the complex nature of the stimulus situation and of the patterns of response to them.

15. “Descriptions and interpretations of learning, as of all aspects of behavior, must be made in terms of mutual relationships among events rather than in terms of independent properties of actions of parts.”²⁰ This statement of agreement makes a place for insight and meaning in learning and settles the argument concerning the mechanistic explanation of stimulus-response.

16. “The organism must be motivated to learn.”²¹ This basic principle is agreed to by all schools. While differences of opinion with regard to details may continue, the fundamental agreement is important. Much has been written on motivation that questions the importance of many measures taken in school to induce learning; but the fact that learning does not take place spontaneously without some drive or purpose in the learner is significant.

17. “Responses during the learning process are modified by their consequences.”²² Success and failure modify responses. The law of effect seems to have much validity in explaining the consequences of learning.

18. “Motivation is the direction and regulation of behavior toward a goal.”²³ This is another way of saying that learning must be directed by goals and that the development of goals is one of the important aspects of the direction of learning.

19. “So-called trial and error learning might be more appropriately described as a process of approximation and correction of try-this-and-that leading to a goal.”²⁴ In other words, there is purpose and goal in so-called trial-and-error learning. It is not so aimless as it is sometimes described.

20. “The transfer of learning from one situation to another is roughly proportional to the degree to which the situations are similar in structure or meaning.”²⁵ This is another way of saying that not only the similar elements in situations transfer but the meaning

¹⁹ *Ibid.*, p. 256.

²⁰ *Ibid.*, p. 258.

²¹ *Ibid.*, p. 262.

²² *Ibid.*, p. 267.

²³ *Ibid.*, p. 269.

²⁴ *Ibid.*, p. 272.

²⁵ *Ibid.*, p. 275.

of the two situations determines the degree to which transfer occurs.

21. "Discrimination, as well as generalization, is an essential aspect of effective learning."²⁶ Not all learning is the seeking of similarities leading to conclusions of agreement; some learning is making discriminations, or seeing differences as well as likenesses. This principle puts some limitations on those who would discount all learning that does not lead to useful principles of action.

In the light of the principles on which agreements have been reached by the different schools of thought it appears, therefore, that we may describe learning as a process that is purposeful and active and goal-directed. It is a function of the total situation surrounding the child and involves insight as well as seeming trial and error. In its highest forms, at least in human beings, learning is intelligent, a creative process, and not merely a mechanistic response to sensory stimuli. Learning affects the whole individual. It is not merely a case of individual sets of neurons and their connections cooperating when one learns, but rather a coordinated and unified pattern of response that occurs in the learner. Education is not a matter of conditioning the individual to a typical mode of reaction and of preparing him to meet fixed situations, but it involves the selection of the significant factors in a situation, ability to adjust to them and to respond in a meaningful way. Learning has as its highest objective the development in the individual of the power to meet new situations intelligently. Since in life the future never patterns itself completely upon the past, the necessity of adaptability, resourcefulness, initiative, and independence in meeting new situations becomes apparent. One of the greatest dangers that confronts the teacher is to adopt that concept of education which thinks of the future as a repetition of experiences of exactly the same patterns as those which have happened in the past and of regarding education as a process of conditioning the learner to meet these fixed situations.

Two Seemingly Opposed Views of Learning. One of the greatest difficulties confronting both beginning and experienced teachers today is the problem of explaining the apparent conflict between learning as habit formation and conditioning, and learning as intelligent adaptation to changing conditions. Education in the elementary school in particular has been greatly concerned with the formation of habits involved in reading, writing, and language in

²⁶ *Ibid.*, p. 277.

its various forms. Traditionally there has been a failure on the part of teachers to see that the development of skills and habits is not the end-all of education, but merely a means to an end; namely, intelligent and efficient behavior in situations where reading, writing and language are appropriate forms of reaction. The same fault applies to the learning of other skills and to the learning of facts in history, geography, science, and the like. When skills are thought of irrespective of their use, this conflict between the new learning and the old becomes very sharp and there seems to be no way of escape except either to drill interminably on skills and the memorization of subject matter or to abandon this time-honored practice in favor of free activities of various kinds.

An Attempt at Harmony.²⁷ There is, however, no necessity of doing either. When skills are thought of in terms of their significance as forms of activity, and when the learning of skills is an outgrowth of purposeful activity of an intelligent type, then practice and drill come forward as ways of perfecting abilities that are highly essential to intelligent purposeful activity. For instance, the boy wishes to play ball for its own sake but he finds that he cannot hit the ball with any degree of success. This leads to the desire to improve. He finds that he must know more about how to hit the ball and that he must practice hitting the ball, even apart from a regularly organized game as such. If it were necessary, he could learn to bat the ball without indulging in isolated practice; but practice itself becomes a game when motivated by a purpose, and when practice is intelligently directed it results in increased ability and therefore enhanced enjoyment in playing the game. Practice is thus an integrated activity involved in learning to play the game well. And since it is motivated by purpose, practice becomes much more effective than when purpose is absent, and requires less time than if it were employed with no realization of its object.

Let us apply the principle to learning to read. In the old school the child began to learn to read without any consciousness of a need for reading and with no clear idea of the purposes for which reading might be used. Reading was taught without reference to its use as means of enlarging experience and as an enjoyable and worthwhile activity in itself. Today the situation is different. A need for reading is established and a variety of purposes for reading are developed. Learning to read is thus a purposeful activity motivated

²⁷ *Ibid.*, pp. 243-286.

by the desire to read and by the stimulus which comes from being in a situation where reading as a mode of procedure is a natural activity.

Habit and Skill in the New Learning. This point of view does not deny the need for the establishment of effective habits, skills, and abilities. Skills in performance follow intelligent and effective practice; but skill is not isolated and is not practiced for itself alone. For example, skills, as in reading, are developed through the practice of reading exercises which are interesting in themselves. Little children read to find out how to carry on some activity. They learn to color, draw, follow directions, and respond to action exercises. They read to satisfy their curiosity about things and people, and to collect information which will be useful in solving some difficulty or carrying on some project. Learning becomes purposeful; skills and effective habit reactions are established, not for themselves alone, but for their use in some meaningful larger whole. The children learn to read by reading.

Memorization and Learning. In this scheme of things memorizing takes its place as a response to some need rather than as a form of mental discipline. The child memorizes what needs memorizing because it is rational and necessary to do so in order to participate effectively in the activity of which memorizing is a part. Memorizing takes less time because it is purposeful. More time is thus available for interesting forms of constructive thinking and doing which have immediate appeal for the child.

Newer Views of Learning and Drill. This deference to the needs and interests of children does not imply that anyone can do the work of teaching nor does it imply that all that has been learned about practice and drill, habit and skill, shall be cast overboard and that the teacher shall launch out anew on uncharted seas without a compass to guide him in his activities. Such a point of view requires that the teacher shall see education and see it whole. It requires that first of all he shall see the child as the one to be educated, inquire into the nature of the child, and seek to understand his modes of learning. It places a major emphasis upon learning as purposeful and intelligent, and takes into account attitudes, interests, and flexible traits as well as habituated and conditioned forms of reaction such as are ordinarily thought of with little regard to their immediate application and use. It forces a change of emphasis and a new idea of the place of reading, arithmetic, writing, and

language in the life of children and of adults. Such subjects cannot be most effectively taught when isolated from their use in socialized activities which constitute the chief basis of living and doing. Drill takes its place in the modern school not as the chief business of the school but as a form of activity necessary to the achievement of skill and the formation of certain habits. It becomes a necessary process in the assimilation of types of data which are known to be essential in carrying on life activities. Drill becomes an intelligent activity, prompted by needs clearly understood rather than a blind, repetitive process that relies chiefly on the law of exercise to establish retention of poorly understood facts and skills.

The Newer Learning and Discipline. The newer learning does not deny the desirability of the time-honored virtues of self-restraint and adequate conformity to the customs of society. Education, on the other hand, is not conceived of as chiefly a disciplinary process designed to restrain and repress the undesirable traits. There is a disciplinary function in every situation. Discipline is not a separate factor which is the end product of a particular educational experience obtainable with particular subject matter, but rather it is the result of the total experience. It is achieved when the individual learns how to live with other people, and it comes from within rather than without. Various subject matters encourage different disciplines. There is no longer subject matter *per se*; there is no longer a discipline of inherited authority to be conformed to but rather there is a discipline of life and living together to be attained. Good conduct is to be achieved through experience just as is any other outcome of education. It cannot be enforced permanently from without; it must be achieved by the learner through understanding and participation.

Learning and Preparation. Learning as preparation for adult life is yielding to learning as a function of present living. The child is best prepared for useful adult life by living richly as a child. This does not mean that he shall not be brought into contact with the experience of the race. It means that the focus of attention shall not be on what the race has believed to be the most valuable knowledges, skills, habits, or ideals, but rather upon present life and means of living it adequately. These abilities are not developed solely because of demands, but also because they are constantly practiced. The child must have experience and repeated experience in order to learn.

Certain products of racial experience are adult achievements that have been the development of centuries. To expect the immature child to attain these same products without adequate experience is a false hope. The child must live here and now. His environment must be controlled, but at the same time a sympathetic and experimental attitude must be maintained. He must learn to read, write, and manipulate numbers; he must develop the art of communication; and he must achieve conventional information concerning the world in which he lives. This must not, however, be presented as a dour and unpleasant duty. Life must be studied because it is immediately of interest and because there is pressing need of knowledge; skills must be acquired because of a demand for them in the going concern of life. Rich experience for its own sake must be the central idea in the education of children. Preparation for adult life is only one of the many outcomes of the educational process, and that is best obtained by a rich and varied experience in childhood. Education must begin with the child's environment and with life as it develops around him.

General Characteristics of Learning. These characteristics as conceived by modern psychologists may be summarized as follows:

1. *Learning Is Growth.* Learning is a process that constantly enlarges the child's understanding of his environment, that leads to better and better understanding of life about him, and that encourages freedom of choice and intelligent action. Growth, both in a physical and intellectual sense, is an inevitable accompaniment of life unless the individual be placed in a sterile environment and denied the necessary experiences that makes growth possible. The richer the experience and the more favorable the environment, the better the growth. This is an inviolable law of nature. Effective learning requires a rich environment, replete with experiences. The child needs play, constructive manual activities, aesthetic activities, and social activities including the study of social life in all its aspects. By these means he should grow into a fully developed person. Denied the richness of environment necessary to a full development of these needs, he will inevitably be stunted in some particular or will develop the undesirable attitudes and traits which are the inevitable concomitant of restricted life. Effective education furnishes the controlled environment for favorable growth.

2. *Learning Is Adjustment.* Learning involves the adjustment of the individual to the world in various ways. Even in a simple en-

vironment, the individual must learn to adjust himself to climate and weather in order to survive. In a complex environment there are many intricate kinds of adjustment necessary. The individual must learn to adjust himself to the changes that take place about him. A few years ago the matter of safety was scarcely heard of; today the automobile, rapidly moving trains, electrical lines of high voltage, all these physical things in the world, require that the child learn a different set of reactions from those required a half century ago and adjust himself adequately to a more dangerous environment. There are also complex social adjustments demanded of the individual today which were unnecessary two or three generations ago. It is the function of the school to teach the child how to meet and adjust himself to these new and complex elements in his environment. He must live in a world of change. And while there is need for the development of independence and initiative in the individual to overcome undesirable conditions and make them better, there is also need for adjustment in the sense of conforming to the laws of nature and other factors in the environment over which the individual has no control.

3. *Learning Is Organizing Experience.* Learning involves repeated experiences each modifying the learner's attitudes, ideals, knowledge, skills, and habits and a new way of looking at things. The animal world changes its habits slowly. Human beings have the ability to profit from experience quickly and to readjust themselves to new situations rapidly. This distinguishes human beings from the animal world. A horse learns slowly and with some difficulty. What he has learned remains more or less unchanged or changes very slowly. A human being is much better equipped to profit from experiences. The meaning of each experience is important. Practice in analyzing experiences to understand their meanings is therefore a necessary aspect of human learning. New experiences modify older experiences. Common objects take on new meanings with each newly discovered use. Words grow in meaning with each added experience. This means that learning is constantly enlarging the understanding and improving the individual's control of his environment and that he is constantly reorganizing his knowledge as he gains added experience.

4. *Learning Is Purposeful.* Learning is more rapid and effective when it is purposeful. Individuals rapidly acquire language, skill in manipulation, social understanding, aesthetic appreciation, etc., when these achievements are necessary in order to attain the realiza-

tion of some purpose. A child may get along with a sign language or with an almost indistinguishable baby talk in the home environment and be greatly retarded in language development; then suddenly, placed in school where such means of communication are not tolerated, he makes unbelievable progress in communication of the conventional type because he finds it necessary in his new environment.

Purposeful learning is always more rapid and more permanent. The more intense the purpose of the individual, the more rapid the learning. This is a law of learning that cannot be disregarded without grave consequences. Unless learning is purposeful, except for those passive kinds of learning that take place as a necessary aspect of living in a world of nature over which there is little control, it is laggard and often of little profit to the learner.

The lack of purpose in learning that distinguished the formal school made necessary all sorts of coercive measures unrelated to the learning in order to cause children to acquire the conventional knowledges and skills. Modern schools try to create situations in which the need for acquisition of knowledge and skill will be an obvious aspect of the environment.

5. *Learning Is Intelligent and Creative.* Learning has sometimes been regarded as merely a matter of mechanical stimulus and response. Given a nervous mechanism and a stimulus, learning, it has been said, consists of responding to the stimulus in much the same manner as the electric bell responds to the pressure upon the button which controls it. Stimulus A brings response A after the individual has learned to disregard irrelevant types of responses and select the true response. Thus far it may be intelligent. After that the effective individual is the one who makes the correct response rather than incorrect ones that may be suggested by the situation. This is thought by some to be too mechanistic a view of learning. There is always something new in a learning situation. No two situations are exactly alike. Some intelligent adjustment is necessary even to the opening of a door by a knob, even though many doors have been opened before, because no two doors are exactly alike and no two knobs are in exactly the same place. Learning therefore involves in all cases an intelligent interpretation of the situation and some selectivity in the response. Otherwise the laws of habit formation would largely explain learning. It is this intelligent aspect of human learning that makes creative thought

possible. Without this, learning could easily be explained on the basis of set, exercise, and effect. This simple explanation is becoming unsatisfactory to modern thinkers. The human being has power to vary his response to the demands of the situation; to change these responses at will and thus to create new forms of response as the outgrowth of intelligent thinking and action. Some psychologists feel that the higher animals also have to a limited extent this power. The mechanistic interpretation of learning, which for a time was perhaps in the ascendant, seems in the last few years to be yielding to a view that permits belief in a mind which bears within itself the power to create new ideas out of old and to modify the situation as well as to be modified by it.

6. *Learning Is Active.* Activity has come to be a word of constant use in the past few years. It has come to mean either mental or physical action that comes in response to a need felt from within rather than an imposed stimulus from without. Activity is a form of response which seems to enlist the interest of the learner because of his sense of the values which are inherent in it. Active learning is purposeful learning to which the learner lends his aid and approval; passive learning is coercive learning imposed upon the individual by a situation or by other individuals who control the learning situation. It is sometimes claimed that the traditional school encourages passive, or coercive, learning and frowns on the independent, purposeful, or active type. This certainly was true of schools of two generations ago, but practice is rapidly changing at the present time.

7. *Learning Is Both Individual and Social.* Learning is in a sense entirely an individual matter. The mechanism which makes the individual responsive to his environment is indubitably his own individual nervous system with its organs of reception and response. In so far as the individual is modified by the stimuli of his environment, that is an individual affair. Each individual must learn by his own activity; others can learn for him in only a limited sense. In a larger sense all learning is social, however, for it takes place in response to the environment in which are other individuals as well as physical things. Learning is social because it would be impossible for any learning to take place except as a response of some type to the social environment of the individual.

8. *Learning Is a Product of the Environment.* As has been implied in previous discussion, learning depends for its stimuli upon

the environment surrounding the individual. All beings, all plants, respond to the environment which surrounds them. Learning takes place in the animal world and to a very limited extent in the plant world. A snail responds to its environment in a snail-like manner, and plants similarly respond in their own way to their environment. The human being is a more adaptable learner and more capable of influence by his environment because he is in possession of more complex and flexible neural mechanisms. In the case of both men and animals the effect of the environment is inevitable. Schools endeavor to present the most favorable and effective environment possible for human learning.

9. *True Learning Affects the Conduct of the Learner.* Gradually, in recent years, thinkers have come to distinguish true learning from false learning. The former is that type of learning which affects the conduct of the individual favorably; that is, it tends to result in improved adjustment to life and corrects and changes wrong ideas and wrong methods of action. False learning, on the other hand, involves those types of learning which leave the individual's conduct largely unchanged. There is undeniably a great deal of false learning in the traditional school. Examples of true learning are easily drawn from life everywhere. The acquisition of language for the purpose of communication is true learning; but the partial incomplete, and unused acquisition of a smattering of a foreign language for the sake of obtaining entrance into a chosen college or for the purpose of earning a coveted degree from a higher institution of learning is false learning in the worst sense. True learning takes place when the individual acquires a type of knowledge or a skill in response to a real need, modifies his conduct in accordance with the new learning, and is forever changed; false learning occurs when the individual acquires a language he cannot use or memorized words that he does not understand. The mechanical response of a parrot is the product of false learning. False learning is profitless learning because it makes no real change in the individual. Few would deny the desirability of a greater emphasis upon true learning in education.

METHODS AND TECHNIQUES IN THE NEW EDUCATION

There are some who seem to have come to the conclusion that since older views of learning have had to yield to newer views, the

principles and techniques of teaching which have been developed in the last century and half must necessarily all be false, that we may safely dispense with all thoughts of method and technique and that knowledge of these is in some way subversive of good teaching. The director of an experimental school was recently heard to say that in selecting his faculty for his school he did not want to employ anyone who had been educated in a teacher's college, normal school, or school of education because such persons were not likely to be progressive in tendency and were apt to be more interested in method than in children. This view is somewhat alarming to serious students of education who cannot believe that all the professional study of education and how to teach is stultifying to those who teach, and that only those who have never given serious thought to the study of education and the art of teaching are especially fitted to undertake the very complex job of developing a new curriculum and new methods. To accept this view would be to dismiss with a wave of the hand all the serious efforts of two or three generations of hardworking professional students who have been responsible in a large measure for the changing views of education which are now becoming apparent everywhere. It seems to the authors that a saner view is to assume that what is needed, as educational objectives change, is a reworking of the older professional materials and a reinterpretation of education according to modern ideals. Who is better equipped to do this task than those who are acquainted with the development of professional education since the Middle Ages?

With new views of learning and teaching there are rapidly developing new techniques of teaching and new ideas concerning the most effective ways of learning. The elaboration of these new views will necessitate a new literature on the subject of teaching methods and techniques. In this and the following chapters of this book the authors have attempted to re-examine the problem of methods and techniques of teaching in the light of new ideas of learning and to develop a treatment of the professional aspects of teaching which will lead the young teacher better to understand the nature of teaching, the nature of learning, and the more important features of the technical preparation of the teacher for his job.

The most important change in the teacher's job came about with the modern emphasis upon teaching as direction of learning. All through the following chapters this view is maintained. Expert

teaching demands more from the teacher in the way of knowledge and skill than was ever dreamed of in the limited philosophy of three generations ago. A modern school where teacher and children together engage in integrated social activities or the study of social life in a modern environment, where activities, projects, unit studies, and the like go on, demands a far better-trained teacher than the cut and dried subject school of the past. A new literature of methodology for such schools is developing, rather slowly at present, but undoubtedly destined to develop with increasingly rapid acceleration as time goes on.

STUDY QUESTIONS

1. Discuss teaching and learning as natural and normal activities of life.
2. Show the need for guided learning in the complex environment of modern life.
3. Discuss the meaning of infancy and the special need for organized teaching in a complex civilization.
4. What is the purpose of teaching?
5. By whom is teaching carried on?
6. What is the status of formal teaching and of teachers in contemporary society?
7. Contrast the older views of teaching with the modern view; teaching as preparing children for adult life as contrasted with teaching as guiding the growth of children.
8. What is meant by a "child-centered school"? Read about and describe what goes on in such a school as contrasted with the traditional school.
9. Discuss the statement: "Teaching at present is a skilled occupation rather than a profession for the large majority of those who are called teachers."
10. Discuss the relationship between the science of education and the art of teaching.
11. Why is teaching a particularly important form of social service?
12. Why is high character so important an element in the qualifications of a teacher?
13. Why is a study of teaching so highly important and necessary?
14. What should an adequate study of teaching include?
15. What are the characteristics of good teaching? Discuss each of the characteristics enumerated in this chapter.
16. Why is an understanding of the nature of learning of such vital importance to a teacher?
17. What is the newer view of learning which seems to be gaining acceptance?
18. What two views of learning are seemingly opposed in theory? In what particular phases of learning do these views seem to conflict most sharply? Is there no way of harmonizing these two views?

19. Is it necessary to abandon practice and drill in order to accept the view that children should be given opportunities to live richly in a child-like environment?
20. Show how such traditional tasks as learning to read, write, and use numbers can be given real meaning to the child through the organization of purposeful activities.
21. Discuss learning and discipline; learning and preparation; learning as growth; learning as adjustment; learning as reorganizing experience, and learning as purposeful activity.
22. Show that learning is or should be intelligent and creative.
23. Discuss learning as active and passive.
24. Show that learning is both individual and social.
25. Discuss the effect of the environment on learning.
26. Distinguish between true and false learning.
27. Show why a study of the techniques of teaching and learning is so necessary and important to the teacher.

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Part Two

METHODS AND TECHNIQUES OF LEARNING

The most effective learning in both life and school is by wholes; that is, as an aspect of some larger activity. Schools are now seeking to develop integrated activities in which the social, aesthetic, intellectual, and physical are natural elements in a meaningful whole, not isolated from each other or from a real lifelike setting. No study of the methods and techniques of teaching and learning would be adequate without full consideration of integrated learning activities. They are generally called projects, units, units of work, or activities.

In addition to an understanding of the integrated nature of learning, however, the teacher also needs to study various types of learning and the techniques involved in them; for these various types of learning are elements in the whole. Since, in the modern school, the teacher is a director of learning, he is certain to meet the necessity of analyzing a complex learning situation into different types of learning and to know how to direct each of these types as they occur. Any complex learning situation may involve one or more of the types of learning described in this section. The teacher should observe learning situations as nearly typical as possible of the types of learning discussed in the following chapter and seek to understand the fundamental principles governing the activities and techniques of each. At the same time he should not lose sight of the effect of each of these types upon the whole.

Chapter II INTEGRATED TEACHING AND LEARNING ACTIVITIES

In the traditional school, teaching has always proceeded as a means of making children familiar with bodies of knowledge and as a way of developing skills and abilities necessary in carrying on the ordinary affairs of life. The approach to these bodies of knowledge, technique, and skill has been through subjects. These subjects have been bodies of data organized in a more or less logical fashion. It has been assumed that they should be taught to the child as organized in this manner.

Recently there has been a sharp attack upon the teaching of subjects in the traditional manner and an attempt to organize learning more psychologically. Most of the readers of this volume, however, may have been educated in a school in which the traditional subject organization prevailed. If they have not themselves experienced the new type of learning and should they not find, in the school where they are engaged to teach, separate periods for the teaching of reading and writing, history and geography, they may be confused and fail to understand teaching and learning as carried on in some modern schools.

It seems necessary, therefore, to present a discussion of integrated teaching and learning activities in order that the teacher may understand the newer view of learning as a unified, meaningful experience.

The Meaning of Integrated Learning Activities. By integrated learning activities is meant those kinds of activities in which children

achieve knowledge and skill in relation to their use in some purposed or planned activity and in a meaningful whole, as contrasted with the learning of facts or skills in isolation and without reference to their practical use. According to what is often called "the new learning," the child should learn in a natural setting those things the value of which he can see and which he wants to use for some specific purpose. True learning is wholehearted and purposeful. Such activities use subject matter as a means toward ends rather than as an end in itself. Sometimes they tend to do away with the study of subjects in the traditional manner and to substitute for formal study of subjects, activities or units of work which may be labelled neither history, geography, science, nor mathematics but a fusion of these subjects into a meaningful whole. At other times they still retain a subject organization. In general, such subject units tend to include constructive activities, the making and doing of something, rather than the abstract study of history or geography without reference to its immediate purpose or use.

Activity schools aim to be natural and informal rather than artificial and formal. They wish to do away with the memorizing and reciting of useless facts and the learning of useless skills, and to substitute for such learning direct experience with life and things. They regard books as sources of information and ideas to be used in carrying out life activities rather than to be memorized for their own sake or for some future use in adult life.

Not all experiments with integrated learning activities follow the same pattern, however; they vary in accordance with the theories of persons who use them. In American schools at the present time an observer will find two contrasting types of integrated units, the subject unit and the activity unit. The subject unit keeps within the bounds of the subject but aims to teach the subject as a meaningful whole. The activity unit tends to disregard subject boundaries and seeks to use essential facts and principles in subject areas to throw light on the current problems which the child meets in his everyday life.

To the proponents of the activity theory, the arts of reading, writing, arithmetic, drawing, language, music, and the like are tools to be used in living and doing, not to be studied for themselves alone. To activists it is wrong to force a child to study tools until he finds a need for them in carrying on his life activities. In the traditional school, tools are taught and practiced in preparation

for their use. In the activity school, they are learned and practiced when there is a need for them.

It is in connection with the learning of skills and the systematic assimilation of knowledge from books that the proponents of integrated activities and the believers in the traditional curriculum come to most marked disagreement. Some leaders in the activity group compromise by having periods for so-called skills and drills in which the arts of reading, writing, spelling, and arithmetic are practiced. When, in addition to this, periodic summaries and reviews of what has been learned in activities of various sorts take place, much of the objection to the unsystematic procedure of some activity schools is removed.

Within the last ten years a number of reports of appraisal indicate that in certain types of activity schools facts and skills are as well or better taught than in traditional schools.¹ The authors are believers in systematic teaching of minimal facts, principles and skills, but believe that this can be done without losing the advantages of the integrated unit of work procedure and the social objectives of the activity school.

Types of Integrated Learning Activities. The integrated learning activity is represented by four major types which are arranged here in the approximate order of their development: the project unit, the problem unit, the subject unit, and the activity unit. The project, or project unit, entered the school first in school plays and programs which antedated the first use of the term project. The problem unit developed either simultaneously with the project or earlier. The subject unit may be considered an outgrowth of the problem unit and project. The activity unit is descended from the project unit, draws ideas from the problem unit, and differentiates itself as sharply as possible from formal subject study and the subject unit as such.

The Project. The project apparently originated in the field of vocational education, from which it was borrowed and adapted to

¹ Wrightstone, J. Wayne, *Appraisal of Newer Elementary School Practice*. New York: Teachers College, Columbia University, 1938.

———. "An Evaluation of the Integrated Curriculum in the Upper Grades," *Elementary School Journal*, Vol. 35 (1935).

Lee, J. Murray, and Lee, Doris, *The Child and His Curriculum*. New York: Appleton Century Co., 1940.

Saucier, W. A., *Theory and Practice in the Elementary School*, 1941, Chaps. V and VI.

general educational practice. Since its adoption in general education, the project has had considerable influence on the traditional school curriculum and older procedures of teaching. It is rightly considered the forerunner of the unit activity of today. Its greatest contribution has probably been to the motivation of learning in traditional schoolwork.

A project is a large unit of work of a natural and lifelike character carried on in a natural setting. In it a problem involving the doing or making of something is attacked as a whole. It is highly purposeful and involves the completion of some undertaking, which may be manual, manual-mental, social, or almost purely intellectual. It is most easily identified when it appears as a concrete undertaking such as the making and equipping of a doll house, the construction of a piece of handwork, or the writing and presentation of a play. It involves many different types of activity, draws its materials from any appropriate source, often disregards subject lines, and constitutes an integrated experience.

Authorities have differed in the past in their definitions of the project. One discussion ² characterizes the project as a point of view rather than a method. Other writers ³ regard the project chiefly significant as a means of motivating school activities. Charters ⁴ wrote of it as a method of carrying on a problematic activity in its natural setting. Parker ⁵ emphasized that the project is a unit of activity in which pupils are made responsible for planning and purposing. Kilpatrick ⁶ in his discussion of the project included four types, as follows:

1. "The Producer's Type," in which the emphasis is directed toward the actual construction of a material object or article.
2. "The Consumer's Type," where the objective is to obtain either direct or vicarious experiences, such as reading and listening to stories, listening to a musical selection, observing a beautiful picture, etc.
3. "The Problem Type," in which the chief purpose is to solve a problem

² Hoscic, J. E., and Chase, S. E., *A Brief Guide to the Project Method*. New York: World Book Co., 1925. Pp. 7-75.

³ Wilson, H. B., and Wilson, G. M., *Motivation of School Work*. Boston: Houghton Mifflin Co., 1916. Pp. 250-66.

⁴ Charters, W. W., *Curriculum Construction*. New York: Macmillan Co., 1923. Pp. 137-46.

⁵ Parker, S. C., *General Methods of Teaching in Elementary Schools*. Boston: Ginn & Co., 1919. Pp. 324-29.

⁶ Kilpatrick, W. H., *Foundation of Method*. New York: Macmillan Co., 1925. Pp. 244-71.

involving the intellectual processes, such as determining the density of a certain liquid.

4. "The Drill Type," where the objective is to attain a certain degree of skill in a reaction—as learning a vocabulary.

There seems to be the implication here that any type of teaching or learning experience may become a project and that the distinguishing thing about a project is the purpose or drive of the learner, as distinguished from the passive attitude which is said to characterize formal learning of the subject type.

To the writers the project seems to be a purposeful activity directed to some specific end which is understood by the learner, which he has helped to develop, and the outcomes of which he finds interesting, valuable, and worth the effort. It is our belief that the project is an earlier form of the present activity unit and that the difference between the two lies chiefly in a change of name and the more complete understanding of purposeful learning evidenced in the activity unit.

The Problem Unit. The problem unit is in reality an undertaking of a problematic character, chiefly intellectual in nature. The problem unit does not necessarily involve a concrete activity of the manual type, although it may do so. In that case it may be called, we assume, a *problem-project*. The problem unit is distinguished from the traditional type of subject instruction in that it approaches a topic, unit, or subject from an inductive viewpoint. Some claim that the problem method is a natural method of learning. In the case of the problem unit, then, the student starts with a felt need and proceeds, through a series of problematic questions, to collect, assimilate, and organize information according to the central idea of the problem studied. Such a unit includes a major problem or problems and many subordinate problems which naturally arise in connection with the unit. For instance, a study of Latin America may be approached as a major problem—"What are the important relations between Latin America and the United States?" This major problem furnishes a theme or thread which serves to give unity and continuity to the study of Latin America. The minor problems are worked out by the teacher in advance and the pupils approach the study of the region as a whole but with definite problems in mind and in a spirit of interest and curiosity which, say its proponents, never characterizes the logical approach. Sometimes these so-called problems included minor projects used to

give concreteness and interest to the study. For instance, in the study of Latin America, a sand-table project illustrating some aspect of the political, social, or economic life of Latin America might be carried on simultaneously with the problem study. This method is a compromise between the project, as advocated by its most enthusiastic admirers, and the logical subject method of the traditional school. That this is a distinct step toward the activity unit can hardly be denied.

The Subject Unit. A later development in the direction of integrated learning is the subject unit, or the unit plan, as it has often been called. This unit plan is not dissimilar to the problem unit, but merely an outgrowth of it. A subject is divided into meaningful units. There is not necessarily any integration with other subjects. A study of *The People of Other Lands*, for instance, may be composed of a series of unit studies dealing with the Dutch people, the Chinese, the Arabs, or the Eskimos. Learning about each of these peoples may be approached from either the logical or the problem point of view. Many elaborations are possible. For instance, Kelty, in her *Teaching American History in the Middle Grades*, develops an elaborate plan for teaching American history by units with preparation, presentation, exploration, assimilation, organization, and examination, worked out in a very definite fashion. Each period is studied as a whole. The older type of assignment, textbook study, and recitation yield to a scheme of directed study in which the child is made largely responsible for finding, assimilating, organizing, and mastering the material. In connection with such units various types of manual, expressional, and dramatic activities may be employed. There is little question that while subject units are not completely integrated learning activities, they go a considerable way in making learning purposeful and meaningful, and may have many of the advantages of the more loosely organized activity units without their disadvantages. They approach the subjects as wholes. They encourage initiative on the part of the pupil, and tend to develop independence, resourcefulness, and other desirable traits.

The Activity Unit. The activity unit is regarded by its users as the only true integrated unit. It aims to represent a lifelike child activity. It involves the study by the child of his physical and social environment from an activist point of view. It is regarded by its advocates as a natural and truly functional medium of education. In the primary grades the activity unit may involve the study of

community life, primitive life, the circus, or any other phase of life which interests the child. In the intermediate grades the study of transportation, communication, distribution, or any other aspect of life which touches the child's experience may be undertaken. In such studies subject lines are disregarded. History, geography, music, art—all the subjects of the school—contribute to the central activity. The school day may be divided into divisions of any kind which seem to meet the needs of the pupils. In connection with such units, progressive educators claim that they are attempting to develop a natural and integrated type of experience, to break down subject walls, to do away with the formalism of the traditional school, to educate the whole child, and to emphasize true learning in all its aspects. A great deal of emphasis is laid upon the development of interest, responsibility, good work habits, creative work, and social traits. That this type of teaching has gained much ground there can be no doubt.

Objections to the Activity Curriculum. It is only fair to say however, that the activity theory meets with opposition from many important educators, both on theoretical and on practical grounds. Some educators⁷ believe that the implications of the activity theory are unguided freedom, a dabbling with knowledge, unsystematic and disorganized teaching, and failure to develop the fundamental skills needed everywhere in life. They are not convinced that the claims of those who regard the activity curriculum as the solution of educational problems are sound. They regard the activity school as an experiment which is as yet inconclusive. They believe that its advocates are over-emphasizing the child, his needs, and his interests. This attitude, they say, leads to pampering, to sentimentalizing, and to neglect of the fundamental training which is every child's birthright.

A Statement of the Authors' Viewpoint. The writers of the present volume take a position midway between the extremes. To them it seems that neither the extremely conservative point of view nor the extreme views of some of the enthusiasts on the progressive side are the answer to the problem. The activity school has much to offer

⁷ Bagley, W. C., "Progressive Education Is Too Soft," *Education*, Vol. 60 (1939), pp. 75-81.

Foley, Louis, "How About This Evidence for Progressive Education," *School and Society*, Vol. 63 (1946), pp. 41-42.

Lancelot, W. H., "The Eight-Year Study Awaits Fair Appraisal," *School and Society*, Vol. 62 (1945), pp. 281-82.

traditional education in its emphasis upon purposeful learning and doing, adjustment to the nature of children, and attainment of the social aims of education. At the same time it is in a process of evolution and change. It is subject to experimental evaluation and criticism. As yet it is not universally accepted nor has it achieved a solution of all basic educational problems.

The student of teaching should become acquainted with the activity theory and seek to judge for himself how far he thinks the idea applicable in our public schools. In different regions the extent to which the activity school has been developed varies widely. The graduate of a teacher-training institution often finds that in the school in which he first teaches there is almost no evidence of the change in educational aims, purposes, and practices found in more progressive schools. Such teachers will need to reorient themselves sharply to public school practices.

It seems to the authors that the beginning teachers should recognize the many good ideas found in the progressive school. The integration of knowledge is essential, but such integrations as are desirable need not demand the abandonment of school subjects entirely, nor the adoption of a plan of instruction which neglects the systematic development of skills and the assimilation of knowledge. Nor are the arguments of the activists equally valid for all levels of instruction from primary school to college. While integration of knowledge is undoubtedly a highly desirable goal, integration may best be attained in early childhood education, after which the systematic study of a field or area may be the most effective means of achieving personal or avocational goals.

The authors do not believe that the present activity curriculum is likely to be permanent. Just as in the past the activity unit has developed from the project, so in the future the activity unit may give way to some subsequent theory of instruction which will seek to provide for a more comprehensive and systematic study of history, science, and social science than is implied in many of the present activity curricula.

That there are obvious weaknesses in the activity program will be evident to the unprejudiced observer. In some activity schools of a decade or two ago children often failed to learn to read, write, perform fundamental processes in arithmetic, and make satisfactory progress in achieving skill in written composition. Their knowledge of history, geography, and elementary science was often incomplete

and fragmentary. In modern activity schools, in the opinion of the authors, systematic attention to skills, frequent reviews and summaries, diagnostic and remedial teaching, and comprehensive surveys of results not only in the development of skills but also in the acquisition of knowledge, are desirable for those children who reveal deficiencies in these respects. Sometimes too much is made of the development of attitudes, interests, and flexible traits. While important, they are not the whole. Knowledge and skill must be developed. The authors suspect that in those activity schools in which marked success is gained in skills and knowledge, there is more systematic teaching than some theorists would like to acknowledge.⁸

The Subject Unit and Activity Unit Compared. The chief service performed by integrated activities seems to be to improve teaching and learning organization. A subject unit offers many advantages not obtained from the use of the daily assignment. More care is taken in developing an effective plan of work. The child is led to see not only the lesson for the day but the sequence of lessons that makes up a meaningful whole and how the parts fit into the complete picture. When the subject involves activities and projects in which the knowledge and skill gained are used in meaningful ways, the subject unit undoubtedly leads to assimilation of ideas and mastery of subject matter and skills.

The activity unit offers many advantages over the older types of teaching and learning. Its function is to develop in the child the tendency to more vigorous reaction, a greater alertness, and a more purposeful attitude. It offers the learner an opportunity for planning, organizing, and assimilating ideas. It encourages selective thinking. It makes learning real by causing the products of learning to be applied immediately. It develops understanding of the meaning of life, instead of verbal memorizings which may mean nothing to the child. All in all, the activity unit, as contrasted with study of the older type, is believed to represent genuine experience rather than unassimilated formal knowledge.

The value of the activity unit in establishing habits and skills is not so obvious as in initiating, motivating, and developing activities and in motivating the learning of skills and facts. It is more difficult to get a learner to practice a needed skill than to engage

⁸ Bagley, W. C., *op. cit.*

Foley, Louis, *op. cit.*

Lancelot, W. H., *op. cit.*

his interest in the collection and organization of material for specific purposes or in carrying on some manual activity. It is conceivable that even adult learners will engage readily in integrated review and drill activities, as in preparing for an examination or in getting ready for a job. Undeniably, unit activities of various types may bring out the need for practice and encourage children to assume a more purposeful attitude toward it; but drill activities are conspicuously absent in the literature of activity teaching.

It appears, therefore, that the chief difference between the subject unit and the activity unit is in the attitude of the users of these methods of organizing teaching and learning toward subject matter. The subject unit is based upon the idea that it is the function of the school to give the child systematic guidance in the assimilation of knowledge and the development of skill. The activity unit places a major emphasis upon experimentalism. Its proponents believe that the subjects as such are adult organizations of knowledge and that children should study life more directly, utilizing subject matter where it is useful in carrying out undertakings. To the authors it appears that each of these points of view is likely to contribute something of value. The systematic organization of the subject unit may have a good deal to offer in the way of suggestion to those who are experimenting with activity units. The activity unit, on the other hand, may have something to offer in the way of organization to those interested in subject units. In a large majority of public schools one is likely to find either a traditional subject organization, a subject unit plan, or a modified type of activity organization.

Subject Matter and Unit Activities. Problem, project, and subject units may be organized in almost any subject of the curriculum. In such units, a major emphasis is placed on securing mastery of ideas and of skills, with a minor emphasis on the activity itself as a means of improving the child's interest and sense of value of the subject matter. Projects of the manual type, such as growing an acre of corn, making a footstool, making a dress, or preparing a luncheon, may readily be developed in the vocational subjects of agriculture, manual arts, and home economics. Problem units may also be organized in these subjects, but they are more common in history, geography, arithmetic, and science. Before deciding on what type of activity is best suited to any of these school subjects, it is necessary to make a careful analysis of their content. Arithmetic, for example,

is a subject in which the drill type of project may possibly be devised; history lends itself to the problematic or reflective thinking type; science and language, as well as other school subjects which are not commonly employed in project teaching, offer advantages and opportunities for organizing projects. Wilson and Wilson⁹ recognize three types of materials out of which projects may originate. These are the problem type, the drill type, and the appreciative type. The following list is illustrative of project possibilities in the different school subjects. It is virtually the list suggested by Wilson and Wilson with a few modifications.

SCHOOL SUBJECTS ILLUSTRATIVE OF PROJECT POSSIBILITIES

1. Agriculture. Growing an acre of corn, caring for a hive of bees, or raising a litter of pigs.
2. Manual Training. Building a corncrib, a hoghouse, or a library table.
3. Home Economics. Making a garment or preparing a luncheon.
4. Physics. Building a storage battery or erecting a wireless outfit.
5. Botany. Charting the weeds of a community and planning and executing a campaign of eradication.
6. Geography. Making a products map of a state.
7. Literature. Dramatizing a story.
8. History. Organizing a state senate or a Thanksgiving pageant.
9. Arithmetic. Attaining a certain degree of skill in calculating numbers.
10. Art. Making an illustrative booklet or a picture.
11. Latin. Celebrating the Saturnalia.

This list is suggestive of rich opportunities for purposeful activities.

The chief objection to the activity unit, in the opinion of many, is its neglect of systematic guidance in the study of certain well-defined subjects such as history and geography. Study of the suggested units, at least in their early stages, will show widely varying types of units, covering many different fields, but at times without any very well-defined plan, even of an experimental nature. To many, such experimental studies seem interesting because of their freshness and their uniqueness, but not as yet to have been sufficiently well coordinated into a well-rounded curriculum. It is also claimed that such units demand a type of ability on the part of teachers which is, as yet, not possessed by the average classroom teacher. If there really are types of knowledge and skill which children need to gain, say these critics of the method, it is not likely that they can be gained consistently by such means.

⁹ Wilson, H. B., and Wilson, G. M., *The Motivation of School Work*. New York: Houghton Mifflin Co., 1921. Pp. 253-57.

Interest and Integrated Activities. In the problem, project, and subject units, interest in the unit is developed by the teacher. In the activity unit, at least theoretically, interest is intrinsic. The subject unit is generally introduced carefully with an approach, including preparation and presentation. In the activity unit the approach is often made just as certainly, but the teacher is supposed to take advantage of interests which arise in the life of the child and create situations in which those interests may be allowed to develop.

The project unit and the activity unit theoretically start with a felt need or difficulty. Interest is generated in the unit because of a real life situation which has developed. The unit demands planning and purposing on the part of the pupils. It represents, therefore, a natural situation for the location of materials, assimilation, creative activity, and organization of knowledge. It is unnecessary to *motivate* because the activity carries its own motivation. In actual practice this idea is often far from realized. If each child could follow his own bent without interference from others that might be possible. How much compulsion is present when a group elects to study Indian life all depends on how many children in the group actually want to study Indian life or become interested as they go along. It is quite conceivable that many children are quite as much coerced in the activity unit as in the subject unit.

In the subject unit, it is recognized that it will generally be necessary to develop an approach to it. Children are not always ready or willing to study "Colonial Life" or "Children of Other Lands" when that is the order of the day. The teacher, therefore, must develop an approach and place the unit before the children in a favorable light. A definite preparation for the study of a unit, a presentation of the problem, and a survey of present knowledge is needed in order to secure cooperation on the part of the child and develop an interest in the unit.

It seems that in either case a good deal of management on the part of the teacher is required. Children's interests and needs vary. Compromise is necessary. The teacher is the best judge as to what the children should study. It is his duty, therefore, to guide them as skillfully as he can to study that which seems worth studying. The art of guidance is here especially necessary.

Directing Independent Study. In connection with the activity unit the old terms of assignment, recitation, and study seem to have been, in many cases at least, largely discarded. If children develop

their own units and voluntarily undertake activities, there is then no need for the assignment of the older type. Present knowledge of the nature of children makes necessary the recognition of the fact that it is desirable to obtain their voluntary cooperation in so far as that is possible. The teacher, as director of the activity, needs to guide the independent work and study activities. In the activity unit this may be quite informal, yet it is just as real as in the traditional school. Pupils are given books to read, problems to work, and the like. The art of assigning work is, therefore, very important.

In the use of the subject unit, oral assignments are often supplemented by the use of study guides, workbooks, or other carefully organized materials which constitute, in effect, new types of assignment. Pupils follow their guidance and work independently on the location, assimilation, organization, and retention of ideas. The units of work are carefully planned, revised, improved, and changed as needed to meet the demands of the pupils. By many, such systematic instruction is regarded as the best example of the development of the teaching art that we have. Others feel that there is little improvement in such guidance over the subject teaching of the traditional school, except in the matter of techniques, and that fundamental problems of the curriculum are left untouched. The latter view is becoming more prevalent.

In either the subject plan or the activity plan, it is important that the teacher take great care to develop challenging situations in which pupils may voluntarily undertake activities. Under ideal conditions, pupils may be expected to develop ability to undertake assignments of work voluntarily. But when they are unable to find their own problems, it is the teacher's duty to organize and direct their learning so that it is effective. Children do not have the experience necessary to choose activities for themselves in complex fields, nor can they always know how to proceed even though they desire to do so. It is the teacher's duty, through effective assignment of activities, to provide profitable experiences for her pupils.

Class Activities and Integrated Units. In all kinds of integrated activities the recitation or class period is largely a time for socialized discussion or work directed by the teacher. The teacher teaches, explains, directs, supervises, and evaluates the work done by the pupils. She is a director of activities. The recitation consists no longer of mere repetition of what has been learned from a book. Pupils report, discuss, question, write, draw, or in other ways carry

on their activity. There is no time wasted in needless repetition of that which is already known. Sometimes the period is chiefly one of planning; sometimes it is directed study; sometimes it is reporting, discussion, and organization; sometimes it is devoted to examination, review, or practice.

Class activities in connection with integrated units are generally informal and socialized. When subject units are followed there may be a somewhat more formal plan. One day may be devoted to attacking the problem and understanding it; one day may be devoted to assignment and survey testing; pupils may then work for several days organizing and assimilating their material. Finally, a time comes for discussion and organization of materials. After that some time may be devoted to examination or testing. Pupils may work individually or in groups. Sometimes the exchange of ideas is necessary; at others individual work is the best plan. At all times, however, there is an informal and democratic atmosphere with pupils and teacher working together, but with the teacher always as the guide and director of activities.

This deformatizing and naturalizing of class activities is an outgrowth of the idea that the school is a social institution and that pupils should learn to live together in a friendly and helpful way. There is no need for a school to engage in a radical reorganization of its curriculum in order to develop class activities of the kind described. It is possible, on the other hand, to conduct integrated activities in such a manner that they are not in any way different in spirit from those in the old type of militaristic school.

Appraising Results. In schools organized on either the subject or the activity plan, periods of appraisal are necessary. Checking results in the subject school is generally a matter of examination. Informal objective tests or essay examinations are often used to test the degree to which the child has mastered subject matter and achieved skill. In the activity school, tests may also be used. Appraisal is often made, however, on a judgment basis. In some experimental schools organized on the activity basis, extensive surveys involving objective tests are used even though the tests do not measure integrated learning. In such schools, however, there are many other outcomes, besides the acquisition of information and skills, which must be appraised. These comprise attitudes, interests, ways of thinking, work and study skills, and social adaptability; and are measurable by the use of behavior records, descriptive question-

naires, inventories, diaries, anecdotal records, interviews, and rating scales.

A check list organized by the pupils is an effective device for the self-appraisal of results achieved. Such a check list is suggested here as an aid to study:

A STUDENT'S CHECK LIST FOR MEASUREMENT OF AN ACTIVITY

Directions. Encircle "YES" if you observed any of the following conditions in solving your project; encircle "NO" if you did not observe them.

- | | | |
|---|-----|----|
| 1. Did the activity originate with the class? | YES | NO |
| 2. Did it grow out of a felt need to do something worth while? | YES | NO |
| 3. Was it interesting to you? | YES | NO |
| 4. Did you ever have any similar experience either at home or school? | YES | NO |
| 5. Were you enthusiastic in finding out all you could about the problem? | YES | NO |
| 6. Did the activity furnish new experiences for you? | YES | NO |
| 7. Did you develop any skill in your experience with the activity? | YES | NO |
| 8. Did the activity demand reading and study in many school subjects of your grade? | YES | NO |
| 9. Did you personally investigate some phase of the problem? | YES | NO |
| 10. Did you have specific directions to follow? | YES | NO |
| 11. Did you learn to keep records? | YES | NO |
| 12. Did you make reports of your investigations and study to other members of the class? | YES | NO |
| 13. Did you obtain assistance from other members of the class in gathering your data and organizing your materials? | YES | NO |
| 14. Were you a partner in formulating plans for studying the unit? | YES | NO |
| 15. Did you learn to write, spell, read, compose, or calculate more effectively as a result of your experience with the unit? | YES | NO |
| 16. Did you feel that much time and effort were wasted in the study of the unit? | YES | NO |
| 17. Could you have improved on the plan of investigation and study of the project were you to do it over again or engage in a similar activity? | YES | NO |
| 18. Could you make use of the knowledge you gained through your experience with the unit? | YES | NO |
| 19. Did you feel that you had accomplished something very definite and worth while when you finished this unit? | YES | NO |

Outcomes. The important outcomes of activity units may be considered the concomitant learnings which have resulted from them. These are the immeasurable results of the work, such as habits of

study, skill in planning and organizing, attitudes, traits, and many other intangible by-products which are not usually recognized. The more tangible learning may be regarded as the subject matter mastered, or the concrete object produced. Another important outcome of such units is the suggestions for future activities which naturally arise from the development of the unit. Indirect outcomes of such units are added skill in writing, composition, drawing, painting, calculating, planning, and organizing.

Subject units place a higher value upon the mastery of subject matter than do activity units. They do not, however, necessarily minimize the concomitant learnings. The development of mastery is one of the important outcomes of these units.

STUDY QUESTIONS

1. What is an integrated activity?
2. What is a project unit?
3. What is a problem unit?
4. What is a subject unit?
5. What is an experience unit?
6. What is an activity unit?
7. What are the advantages and disadvantages of each type of unit?
8. How is each type of unit organized?
9. How is subject matter used in connection with each type of unit?
10. In what ways does the direction of independent work differ in the two broadly contrasted types of units?
11. How are class activities conducted in connection with the activity unit?
12. How do class activities in the subject unit differ from those in the activity unit?
13. How may the results of teaching and learning be appraised in the use of the activity unit? How with the subject unit?
14. What are the outcomes of each type of unit?

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Chapter III OBSERVATIONAL LEARNING

Observational learning constitutes an essential phase of the learning process in all fields of study and in all grades of instruction. It is the most natural way of obtaining information about concrete objects and events of real life; it is more fundamental and basic than the somewhat artificial processes of reading and studying. It is unfortunate that learning through nature's avenues, the senses, is largely left to chance as soon as children have developed some ability to deal with abstract ideas or have mastered a little of the mechanics of the language. Direct observation should not be limited to special fields of study and to the primary grades. The practice should be extended and continued in all stages in the development of the individual. The purpose of this chapter is to set forth some of the more important factors concerned in training children to be observant in getting and recording experiences.

Observation Is Natural But Must Be Directed. Observation is a method of sensorial learning through which the individual acquires knowledge of the world about him. Through the receptors of hearing, he identifies and recognizes sounds; through the receptors of sight, he becomes acquainted with and aware of distances, form, size, and color; through the receptors of his skin, he becomes aware of pain and temperature (coolness, warmth); and through the receptors in the muscles and in the joints, he becomes conscious of pressure. To this list of avenues of learning, there may be added others located in the mouth and nose through which the individual acquires information about tastes and odors.

A child has had an important type of experience before he enters school. This experience has furnished him with a background of observational experiences with which the teacher should become familiar as early as possible. It is surprising how great or how meager this stock of observational material may be upon the child's first entrance to school. The more intelligent children will have a large stock of information because they are more alert to their surroundings than the less intelligent. The less alert and intelligent ones will have a meager stock of information, irrespective of the richness of their environment. They are usually less observant of their surroundings.

It is never safe, therefore, to assume that all children have an adequate stock of observational experiences when they attain school age. The teacher must take an inventory of their equipment to discover what is lacking and what needs revising. Incidental and undirected contact with one's environment does not guarantee adequate experiences. Directed education must enter the role of observational learning and organize it in a systematic way for future use. It is often true that much of children's observation out of school is incoherent, lacking in unity, and often very inaccurate. This condition makes it all the more necessary for the teacher to take an active part in building up an adequate stock of observational experiences.

Purposeful Versus Nonpurposeful Observation. Observation as a method of obtaining experience may be regarded as most effective when it is directed by purpose. The ineffectiveness of undirected, or purposeless observation, is excellently illustrated in Kipling's story of "Kim." Kipling records, among other things in this interesting story, Kim's sightseeing in Lurgan's pearl-mending shop. Here, as the story goes, Kim is bewildered as he peers about the masses of oriental curiosities, such as pearls, vases, unique stones, jewelry, mechanical toys, and other curios. The boy's observation is undirected and therefore ineffective as compared with directed observation of a skilled observer.

Another illustration of the relative effectiveness of these two types of observation is to be found in a group of realistic stories, entitled "Evenings at Home" by Dr. John Aiken and Mrs. Anna Barbauld. The story "Eyes and No Eyes" gives an interesting contrast between the observations made by two boys who went out walking one afternoon for amusement. The one boy sees practically nothing. The other boy marvels at the wonder and beauty of the

many interesting things of nature. He uses his eyes. He is purposive in his observation.

This illustration is important in its implications of the ineffectiveness of observation resulting from undirected training. The difference between the observations made by the two boys is largely due to the difference in habits of observation which they had previously cultivated. The fact that the one boy could recall much that he observed while the other boy could recall scarcely anything from his trip, is good evidence that the former was actively aware of his surroundings. But the fact that the latter could recall very little from his walk is not good evidence that he observed nothing. He may not have been actively aware of his environment but he learned just the same through his contact with nature. His observations were nonpurposeful as compared with those of the boy who was apparently actively awake to his surroundings.

Much of our learning is similar to that of the boy who was wide-awake to his environment. Nevertheless, we learn an appreciable amount from undirected and nonpurposeful observation. It is always easier to detect those aspects of their environment of which children are actively aware than it is to discover what they indirectly acquire through their surroundings.

The Value of Observational Learning. Observation is both a means to an end as used by the teacher and an end in itself as viewed by the pupil. In either case, it should be directed or purposeful to be effective. To the pupil, observation is a means of acquiring information, collecting data, and obtaining accurate ideas about things and events. To the teacher, it gives an opportunity for training the pupil to gather data. He is interested in developing the abilities involved in observation, as well as in enlarging the child's experiences. In this latter instance, observation is usually unreliable, for the activity is nonpurposeful. The learner is not analytical.

Skill gained in directed observational learning may be expected to improve the ability of children to add to their fund of general knowledge. They will be interested if they learn how to observe successfully and if the objects of their observations seem significant to them.

The Fields of Observational Learning. Subject matter for observational activity is not limited to any particular field of study. Wherever pictures, graphs, charts, persons, objects, events, and processes of any type are to be found, observational study is involved to a

greater or lesser degree. Some types of materials, however, are more suitably used for early training in observation than others. Out-of-class events and happenings furnish excellent material for children to observe and report in class. In fact, observational work can be effectively initiated by utilizing these activities among the children of the lower grades of the school. Telling about things which children see in their home environment constitutes a worthwhile activity for classroom work and should be encouraged. This practice may be extended as children develop power to observe from year to year. Older children are usually more capable of recalling their experiences in detail than younger children and, as a result, they are less liable to err in making observations. The more practice children get in recording observations, the more accurately they will report on them later. Projects of all sorts, such as may be developed in geography, history, and nature study, lend themselves readily to observational learning. Trips, excursions, and visits to local or distant places of interest come under the same category of activities, and furnish an abundance of material for observational training. Careful and accurate observation is an absolute requirement in many of the science subjects, especially in the field of chemistry. It should also be made a requirement through training in all the other subjects of the school curriculum.

Interest in Observation and How to Get It. Interest in observational activities depends largely on the nature of the objects, persons, or things to be observed, their novelty and their appeal to children. A trip to a local factory or museum may be more interesting than pictures and printed pages of books and magazines, or even some of the more familiar objects in the pupil's immediate environment. The very fact that there is always a certain amount of fascination associated with visiting local places of interest is sufficient in itself to stimulate observation. In addition, when children know that they will be required to give an account of their observations later in class, they seem to enter into the activity with greater zeal and zest. The sample check list given under the section dealing with recitation activities illustrates how children may be held to account for their observations. It will often be found practicable and valuable to motivate their observations by asking a few guiding questions or by making suggestions about the materials to be observed. A check list, such as the following, will tend to arouse children's enthusiasm to observe things in nature.

HOW MUCH DO YOU KNOW ABOUT NATURE?

Directions. Draw a circle around "YES" if you believe the statement or question is TRUE; draw a circle around "NO" if you believe it to be FALSE.

- | | | |
|---|-----|----|
| 1. Our first bird visitors from the South in the spring are the robins and the meadowlarks. | YES | NO |
| 2. Crows remain with us throughout the winter. | YES | NO |
| 3. Wrens come north in the spring before the robins do. | YES | NO |
| 4. Birds sleep in thickets. | YES | NO |
| 5. Robins eat earthworms. | YES | NO |
| 6. All birds sleep standing up. | YES | NO |
| 7. You can tell a meadow lark by its song. | YES | NO |
| 8. An oriole is the same color as a crow. | YES | NO |
| 9. Catbirds are beautiful singers. | YES | NO |
| 10. These birds remain with us throughout the winter: sparrows, crows, owls, hawks. | YES | NO |
| 11. The blue jay, mocking bird, thrush, and grosbeak are all large birds like the crow. | YES | NO |
| 12. Dandelions are among the first weeds to flower in the spring. | YES | NO |
| 13. Violets bloom until fall. | YES | NO |
| 14. Trailing arbutuses are usually found in wooded land. | YES | NO |
| 15. Are crocuses early spring flowers? | YES | NO |
| 16. Does the groundhog go South for the winter? | YES | NO |
| 17. Do frogs croak in the fall? | YES | NO |
| 18. Frogs live in ponds. | YES | NO |
| 19. A tadpole is a young frog. | YES | NO |
| 20. Frogs and toads live together. | YES | NO |
| 21. Bumblebees have feathers. | YES | NO |
| 22. Humming birds are very large. | YES | NO |

Children will enjoy answering a list of statements and questions as indicated in the check list above. Their desire to find something definite and novel in their study will be satisfied in this practice. Growing power to observe accurately will tend to stimulate further activity.

Directing Observation. Since observation is more effective when directed than when undirected, the assignment should be designed to get pupils to observe things accurately and to record their observations in some systematic manner. A good set of direct questions about things and objects to be observed, whether they be real things in the children's environment or merely pictures in books and magazines, will aid greatly in directing their efforts in observing the essentials of the objects and processes observed. Direction exercises of the type commonly used in reading will also be found useful in

getting children's attention focused on the significant things under observation. Check lists and observational outlines will be found invaluable for this purpose. A sample of the multiple-response type of check list will illustrate how children's attention may be directed to the important phases of their observations.

A CHECK LIST FOR GUIDANCE IN MAKING ONE KIND OF OBSERVATION

Directions. Draw a line under the word or words which describe what you are to observe.

- | | | |
|--------------------------------|-----------------------------|----------------------------|
| 1. a. printed materials | d. animals | f. insects |
| b. objects | e. birds | g. plants |
| c. persons | | |
| 2. a. museum | c. factory | e. nature |
| b. grocery store | d. library | |
| 3. a. books | c. bulletins | e. newspapers |
| b. magazines | d. circulars | |
| 4. a. words | c. paragraphs | |
| b. sentences | d. chapters | |
| 5. a. pictures | c. graphs | e. statistical tables |
| b. charts | d. maps | |
| 6. a. number of pages in books | c. indexes | |
| b. tables of contents | d. bibliographies | |
| 7. a. main captions | c. titles of chapters | |
| b. titles of paragraphs | d. summaries | |
| 8. a. questions asked | c. important facts | e. type examples |
| b. questions answered | d. test and study questions | |
| 9. a. reference books | c. library cards | e. other library equipment |
| b. reading guides | d. library files | |
| 10. a. how to gather facts | c. how to organize them | |
| b. how to record them | d. how to interpret them | |

This check list is suggestive of a technique which the teacher may use to advantage in directing children's observations. It will be found a valuable aid in getting the assignment under way. There are other methods of organizing materials in check lists. One may construct any number of forms, such as direct questions, identification exercises, alternate-response exercises, or any other which may be readily adapted to the materials under construction. The alternate-response, the direction questions, and the multiple-response

exercises will be found most practical to construct for directing children's observations. Usually such exercises as these tend to motivate children's observations as well as to make clear and definite the objects, persons, or things to be observed.

Class Activities. The commonest type of recitation activity preceding and following an observation is a socialized recitation, including questioning, answering, and discussion by the pupils and teacher. This discussion should serve to orient pupils in their observations and to correct mistaken impressions, as well as to bring out the salient points of the objects or processes observed. A concrete illustration of an observational project will make clear a type of activity that may profitably be engaged in by the class.

A TRIP TO A GROCERY STORE

The teacher and pupils plan a trip to a local grocery store. The assignment gives the necessary directions to call children's attention to the things to be observed. The visit to the store takes place; children observe objects, both the familiar and the unfamiliar; they ask questions and receive answers from their teacher; and after a period of time, they return to the classroom with a great deal of enthusiasm about the things which they saw at the store. Since the visit will consume more time than the regularly scheduled class period, the discussion is held over until the following day. Then the teacher may use the plan¹ suggested below in conducting the recitation.

QUESTIONS FOR CLASS DISCUSSION

1. What things did you see at the grocery store?
2. What are scales?
3. What does the grocer do with the scales?
4. What things can you buy at the grocery store?
5. How does the grocer send things to your mother?
6. Can you buy potatoes, peas, cakes, soap, sugar?
7. Can you buy a dress at the grocery store?
8. How do you get things at the grocery store? Does the grocer give them to you?

These questions may either be written on the blackboard or dictated to the children for answers, or they may be used to initiate class discussion. This will be a matter to be determined by the needs of the class.

The recitation may continue by getting children to classify the materials which they observed at the store in the following manner:

¹ Yoakam, G. A., *Reading and Study*. New York: Macmillan Co., 1928. P. 317.

CEREALS	FRUITS	FLOURS
1. corn flakes	1. apples	1. wheat
2. grape nuts	2. pears	2. graham
3. puffed rice	3. peaches	3. rye
4. rolled oats	4. plums	4. rice
SUGARS	SPICES	VEGETABLES
1. maple	1. pepper	1. potatoes
2. granulated	2. allspice	2. turnips
3. pulverized	3. mustard	3. carrots
4. cane	4. ginger	4. parsnips

The teacher may write the headings of this chart on the blackboard and have the children help him to classify the various items under their proper captions, or he may have the headings mimeographed on a sheet of paper and have the children put the various items in their proper places on the chart.

This exercise may be followed up by having children make a résumé of their observations in written form, or their observations may be written on the blackboard or hectographed in the form of a chart for further study. Often a multiple-response exercise such as the following will prove helpful in getting children to recall their observations:

1. The grocer sells: (1) shoes; (2) bicycles; (3) nails; (4) potatoes; (5) clothing.
2. The grocer measures sugar with: (1) a sack; (2) a scale; (3) a cup; (4) a scoop; (5) a tin can.
3. The city people buy things at the grocery store with: (1) jewelry; (2) bonds; (3) scrip; (4) money; (5) furs.
4. The modern grocer sends things to your home by: (1) horseback; (2) wheelbarrow; (3) bicycle; (4) automobile truck; (5) horse and wagon.

An almost limitless number of things can be done to have children tell about their visits to local places of interest. It is more or less obvious that such training is fundamental in getting children to utilize their everyday experiences in developing ability to observe more keenly the things in their immediate environment.

The Need for Controlled Practice. Inexperience is usually the cause of erroneous observation. This suggests the need of controlled practice in observing objects and processes. Experimental evidence confirms the presence of errors in observation in practically every field; for example, to quote from Gates: ²

² Gates, A. I., *Psychology for Students of Education*, revised edition. New York: Macmillan Co., 1930. Pp. 2-3.

A brief scene involving a quarrel which had been carefully rehearsed was performed before a group of forty professional men. Believing the quarrel to be genuine and anticipating the use of their testimony in court, the witnesses immediately wrote out a full account. Thirteen of the forty observers failed to record as much as half of the important events and the others omitted from one fifth to a half of them. Even in these apparently conservative reports, from five to fifty per cent of the statements were erroneous.

Even when the surprise and possible emotional disturbances are eliminated by warnings and instruction and when the observers are aware of the amount and kinds of errors usually made in such tests, glaring omissions and errors occur. When the object of observation is a still picture, a mechanical device, or even a postage stamp, the unreliability of ordinary observation is still apparent.

That ordinary observation of objects and events is usually very unreliable is well illustrated by the example just cited. Since the unreliability of professional men's ordinary observations is as great as indicated in this particular experiment, one can only infer that children's ordinary observations would be much less dependable than those of the group of professional men. This evidence, while not conclusive, should prove helpful to teachers who are interested in training children to be accurate observers. It is very important that teachers become conscious of children's failure to report accurately their observations of the most common things in their environment. To be effective, observation must be trained. One may be an accurate observer in one field but poor in another. This condition is due to the fact that the character of events in the one field of study is not always identical with that in another. Poor observers are inaccurate mainly because they either lack experience or anticipate results. Oftentimes the repetition of observations by the same or different observers is helpful in correcting errors due to haste or inexperience or both. Other things being equal, the pupil who has a definite purpose will observe much more than the one who has none. The untrained, nonpurposeful pupil will have much difficulty in making accurate reports on his observations.

He will gain such skill only by directed practice.

Checking Results by Check Lists. Since there are many types of observations which a student may make, it will be necessary to have several different kinds of check lists to evaluate them. For example, one may visit a museum and observe the great variety of natural, scientific, and literary curiosities. Or he may visit a grocery store

and observe the many different kinds of vegetables, flours, fruits, sugars, spices, and a host of other food products. Or he may be interested in observing reading materials, such as books, magazines, encyclopedias, reading guides, or events and happenings either in a direct or in a vicarious manner. But each type of observation will call for a check list of items entirely different from the other. No one check list will do for all these different types of observation. A more or less specific form will be necessary for each type of observation. One such check list may be made out for observing a particular kind of reading material in the following manner.

A STUDENT CHECK LIST FOR EVALUATING OBSERVATION OF A BOOK

Directions. Draw a circle around "YES" if you can answer a question about a book which you observed, or draw a circle around "NO" if you cannot.

- | | | |
|--|-----|----|
| 1. Did you observe the title of the book? | YES | NO |
| 2. Did you learn the author's name? | YES | NO |
| 3. Did you note the color of the back of the book? | YES | NO |
| 4. Did you find out how many pages were in the book? | YES | NO |
| 5. Did you observe whether there was a table of contents? | YES | NO |
| 6. Did you observe how many chapters it contained? | YES | NO |
| 7. Did the book contain an index? | YES | NO |
| 8. Did it have a glossary? | YES | NO |
| 9. Did it have a bibliography? | YES | NO |
| 10. Were the references explained? | YES | NO |
| 11. Was the bibliography located at the end of each chapter? | YES | NO |
| 12. Did you read the preface? | YES | NO |
| 13. Did you learn the purpose of the book? | YES | NO |
| 14. Did it answer questions about history? | YES | NO |
| 15. Did the book have study questions? | YES | NO |
| 16. Did it have graphs, charts, maps, or tables? | YES | NO |
| 17. Did it have pictures? | YES | NO |
| 18. Did it contain summaries? | YES | NO |
| 19. Could you tell in a general way what the main captions of the chapters were? | YES | NO |
| 20. Did the book appear to be easy to read? | YES | NO |

The Use of Recall and Recognition Tests. Ability to observe and to recall what one observes may be measured with considerable degree of satisfaction by recall and recognition tests of the objective type. These tests may be made up of items in the nature of identification, multiple-response, and limited-recall exercises such as are illustrated on the following page.

IDENTIFICATION

Properly classify under each of the following headings the articles which are listed below.

<i>Vegetables</i>	<i>Fruits</i>	<i>Spices</i>	<i>Flours</i>	<i>Cereals</i>
1.	1.	1.	1.	1.
2.	2.	2.	2.	2.
3.	3.	3.	3.	3.
Rice flakes	Carrots	Potatoes	Apricots	Plums
Graham	Pepper	Puffed wheat	Rolled oats	Ginger
Pears	Rye	Wheat	Cloves	Beets

MULTIPLE-RESPONSE

Which of the following articles could be purchased at a grocery store? (Draw a line under correct answers.)

1. Vegetables 2. Shoes 3. Fruits 4. Spices 5. Nails

LIMITED-RECALL

What are three articles which you observed at the grocery store?

1. _____ 2. _____ 3. _____

These objective tests should be supplemented by oral and written reports of children's observations. Recall tests are usually effective in getting a check on the accuracy of observations in detail. For this reason they should be used more extensively than other types of tests. The amount and accuracy of recall are in direct proportion to the accuracy of observations. That is, other things being equal, the more accurately the details are noted in observations, the more accurate the recall of them will be. Regardless of the type and nature of the test employed, it should be borne in mind that tests of ability to observe will be based on the purpose for which the observation was made. Directed observation should be measured in order to diagnose weaknesses and to arrange exercises for improvement.

Important Outcomes of Observational Learning. Observation is itself indispensable in all kinds of learning, whether directed or undirected. But it is more effective when controlled. The aims set up will determine the outcome. It is important that pupils be trained to observe accurately; that they learn to pick out the essential and relevant things; and that they develop ability to report what they have observed without making gross mistakes. Ability to remember what is observed is important, as well as the habit of observing and

being interested in persons, processes, objects, and events. If children are taught to observe keenly, the teacher will find that they will be able to tie up what they read about to real life in more effective ways. The observation exercise should be regarded primarily as a means of training children to observe things accurately.

STUDY QUESTIONS

1. What is a good illustration of direct experience? of vicarious experience?
2. Under what condition might observation be an end in itself in learning?
3. What is the value of directed observation?
4. How reliable is ordinary observation?
5. What characteristics of observational learning are illustrated by such stories as "Eyes and No Eyes" and "The Good Natured Little Boy"?
6. Why has observation been limited to certain fields of study?
7. How is observation affected by the use of real objects and events, pictures, graphs, maps, and the like?
8. What are some of the qualities of a good observer?
9. What is a type of activity in which a class might engage as a unit in observation?
10. How are inaccuracies in observation effectively corrected?
11. Why do some people observe more than others in the ordinary course of a day's events?
12. What one factor will largely determine the type and nature of tests to be employed in checking on observation?
13. What is the value of a student's check list for evaluating observation?
14. What is the value of experience gained through direct observation?

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Chapter IV MOTOR LEARNING

It is generally understood that there are few mental activities which are not intimately associated with motor activities, but it is difficult to determine whether or not one type occurs without the other. Ordinary observation reveals, however, that learning of a more or less mental type is in the ascendancy at one time and that motor or movement learning is chiefly involved at another. Nevertheless, in order to understand the working of the learning process, it is often necessary to consider it from different angles. This practice enables one to understand more fully the functioning of the total process of learning. Since considerable learning in school is chiefly of the motor type, a brief treatment of it will be given in this chapter.

Motor Learning Is Movement Learning. Movement learning is a term which may be used to describe what is commonly known as motor learning. It is learning through doing, and represents a type of learning which is commonly employed by children in many activities involved in the school curriculum. It may be simple, as in learning to hold the index finger in a certain position in writing, or it may be very complex, as in learning to transmit long words by telegraphy. It is characteristic of the manual arts, home economics, and certain commercial subjects, such as typewriting, comptometry, and shorthand; and also of the laboratory sciences, among which may be mentioned biology, chemistry, and physics. In all these subjects certain motor skills are involved. Some of these skills are of quite general significance or use; some of them are peculiar to the subject and have little significance anywhere else.

Skills Involved in Motor Learning. Usually, there are two general

classes of skills involved in movement learning: skill in understanding the processes, such as operating a motor or building an electric battery; and skill in bodily movement, involving muscular coordination, which is essentially a motor or physical skill. In the first instance, whatever bodily activity is involved is concerned with getting an understanding of a process or principle by laboratory experiment and is incidental to that major purpose. In the second instance, the situation is just the reverse. Here the mental activity is incidental and is concerned primarily with the development and successful accomplishment of the play or work skill of the movement type, as in batting a ball, throwing a curve, swinging a golf club, riding a bicycle, skating, planing a board, sharpening a tool, and the like. The end here is success in the skill. The chemical laboratory experiment is a capital illustration of a skill which is fundamental to understanding a process or principle, whereas playing tennis is a good example of a motor skill which is an end in itself.

Common Uses of Motor Learning. The function of movement learning consists, first, in enabling children to do those things which are necessary in common life activities. Eating, walking, and talking involve much motor activity. Learning through the muscles, more or less, also helps the child to understand things and processes. It is a main function of the school to furnish the pupil with opportunities to perfect motor skills and to understand them better. Therefore, learning the meaning of the process is sometimes entirely unnecessary, since often the activity is sufficient in itself. The child first learns to ride the bicycle for the sheer fun of it. The laws of mechanics which enable him to operate a bicycle are concerns for later years, but he can never understand a bicycle fully until he has learned how to run one. This learning seems to be especially enjoyable and necessary in childhood, but difficult, if not impossible, in old age.

In motor learning, the individual is concerned with the acquisition of certain skills which are not only essential to the understanding of processes and operations but also important to the graceful performance of bodily movements. In learning to read, the learner must develop correct habits of eye movement and control, and proper articulation, audible or silent. In acquiring skills of the physical type, such as skating, dancing, golf, sharpening a tool, or planing a board, the learner must develop correct habits of

bodily posture, movement, and equilibrium. In short, the learner must not only acquire knowledge of the character of good performance, but he must also attain considerable skill in producing it as a result of practice. In such motor learnings skilled direction on the teacher's part is an essential.

Motor Learning Situations. The content or subject matter in which the learner is interested will determine, in part, what skills must be developed. Occasions calling for the development of movement skills will be found in the laboratory sciences, chemistry, biology, and physics; in the vocational subjects, home economics and manual arts; in the commercial subjects, typewriting and shorthand; in the fine arts; painting, drawing, and music; and in certain extracurricular activities, such as athletic games and other sports. On the basis of motivation, the movement skills may be subdivided into play and work skills, in which case a number of specific activities may be found best adapted to the development of these skills. For instance, in developing the play skills, skating, and playing ball and tennis, physical education equipment will be needed; whereas in developing the work-type skills, such as measuring the quantity of oxygen in a given amount of air, sharpening a tool, or operating a lathe, laboratory equipment and content from the fields of science and industry will be necessary. For purposes of illustration, a partial classification of the subject-matter fields in which movement skills of the play and work types are found will be suggested herewith for study.

CURRICULAR AND EXTRACURRICULAR ACTIVITIES IN WHICH MOVEMENT SKILLS OF THE PLAY TYPE ARE INVOLVED

1. Mechanical puzzles
Keys, links, rings, squares, triangles, etc.
2. Room games
Odd and even, bean bag, ring toss, etc.
3. Games outside of school
Crokinole, marbles, hide and seek, prisoner's base, crack the whip, etc.
4. Sports
Skating, dancing, skiing, tennis, handball, baseball, basketball, swimming, canoeing, fishing, hunting etc.
5. Miscellaneous
Whittling, carving, tinkering, building a radio or a ship model, playing a musical instrument, caring for plants, caring for pet animals, etc.

CURRICULAR ACTIVITIES IN WHICH MOVEMENT SKILLS OF THE WORK
TYPE ARE INVOLVED

1. Laboratory sciences
Manipulating iron and ring stands, bunsen burners, glassware, dissecting instruments, microscopes, galvanometers, siphons, pumps, etc.
2. Industrial arts
Mechanical drawing, cabinet-making, lathe work, pattern-making, forging, casting, etc.
3. Arts
Painting, drawing, sculpture, etc.
4. Natural and social sciences
Manipulating charts, maps, globes, stereoscopes, lantern slides, magazines, readers' guides, etc.

The number of curricular and extracurricular activities in which movement or motor skills are involved may be extended almost indefinitely. The illustrations given above merely suggest the possible use which teachers may make of learning through doing of this type.

Guidance Is Essential to Secure Interest. Motivating movement learning is not so difficult a matter as motivating associative learning. However, it is not safe to assume that motivation will take care of itself. Activities, whether of the motor or of the mental type, call for careful guidance. Otherwise, practice or drill work becomes monotonous and therefore uninteresting to the learner. Usually, in learning a movement skill, the same general principles should be adhered to as in learning a mental skill, such as adding or subtracting numbers. As in drilling on the arithmetic combinations, the length of the practice periods and the intervals between them must be carefully adjusted so that optimum working conditions will be provided. Furthermore, to keep up interest in this sort of formal practice success and progress must be indicated at every turn. In fact, all the principles of guidance and motivation employed in mental drill work will be found applicable to motor or movement learning. Practice in singing, dancing, skating, playing games, planing a board, or operating a lathe will become very uninteresting to the learner if carried on for long periods without optimum intermissions or intervals between practices. Success is stimulating in movement learning as in the case of mental learning.

Other things being equal, interest in the movement skills will be less difficult to provoke than in the case of the more abstract

mental skills. This fact is more or less obvious for the reason that the learner is practicing with concrete things in motor manipulation, whereas he is practicing with abstract ideas in mental manipulation. Working with physical things adds interest and enthusiasm to the task for most children, although there may be a few exceptions to this principle. It depends on the mental capacity of the individual. Some very intelligent children may find little or no interest and enjoyment in manipulating tools or other physical equipment, whereas those children with limited mental capacity may become intensely interested in the activity. However, all children, irrespective of their mental status, enjoy the play skills.

The Direction of Independent Work. The assignment in motor learning, in general, should be similar to that in mental learning. The work must often be very carefully directed and guided to prevent loss of time and error. In associative learning, the assignment may consist of directions showing the general character of the process or operation and the specific details of each step in it. For instance, in adding numbers, the directions will make clear where to begin, how to proceed, how to carry, how to put down the sum, and the like; in writing, the directions will depict some of the hand and arm movements, how high to make certain letters, and how to space them. In solving a problem in geography, such as why some cities are larger than others, the directions will make clear what references should be read, what materials, as maps, charts, and statistical reports, will be of the greatest value in solving the problem. Likewise in the case of movement skills, such as playing tennis, the directions will specify the size and shape of the court, the kind of net used, its height from the ground, the size and shape of rackets, how to make certain kinds of strokes, and the like; in operating a lathe, the directions will specify the parts of the machine, the adjustments involved, how to apply pressure, and what precautions to observe in using the equipment. These directions may be given in the form of a job sheet, a laboratory guide, a manual of directions, a contract, a pattern manual, or in some other written form for study. The assignment for practice should embody the usual procedure of making assignments for drill work. The chief precaution to take is to make certain that the learner not only knows what he is to practice but that he also knows how to practice the skill correctly. This necessitates putting the learner through several practices or rehearsals before making the assignment for individual work. The

correct performance of a skill must be established in class. Otherwise, individual practice may result in making awkward movements and many errors.

Theory Must Precede Practice. There are two general classes of activities engaged in by pupils in learning a skill of the movement type. In one case, there is the activity of learning the theory of the skill, which will consist largely of explanations by the teacher, discussions by the group, and understanding by the learner. In the other case, there is the activity necessary in fixing the skill, which consists of practicing the performance by the learner until it functions automatically. These are not two isolated activities; instead, they articulate one with the other in perfecting the skill. In handwriting, for instance, if the objective of the activity is to attain a certain standard of proficiency, the learner must not only have knowledge of how to hold the pen and of the arm and finger movements, but he must also get the necessary practice before the goal or standard is reached. In case of baseball batting, the player must not only understand the theory about holding and gripping ball bats, but he must also obtain the actual experience and practice of hitting both straight and curved balls. In all forms of motor learning, therefore, a knowledge of the best theoretical procedure is essential.

The Teacher's Function. The teacher's function in developing movement or motor skills is practically the same as in developing mental skills. There are an unlimited number of things which the teacher may do to make clear the skill to be learned. Among other things, he may explain the specifications of the activity. Or he may demonstrate the use of certain kinds of tools or equipment, and whenever necessary illustrate the performance which is to be undertaken by the pupil. Then before actual practice is given in the activity, he may require each pupil to rehearse the performance once or twice to make certain that the pupil perfectly understands its parts. Or better still, he may use the rehearsal for purposes of making clear the performance as a whole or unit. For, after all, it is the large movement that the learner must understand and practice rather than its specific parts. It is probably unwise to have the activity done in parts, since it is much more difficult to integrate the specific components of a performance than it is to learn these isolated parts, although this practice may be resorted to when the operation or process permits of being broken up into its elements

without losing its significance. It is much more practical to have each individual go through the entire unit of work. Thus he gets the experience as an entity, and this is what is needed in most instances. The teacher may employ any or all of the following materials to aid in making the performance clear to the learner.

- | | |
|--------------------|-------------------|
| 1. Charts | 7. Real objects |
| 2. Pictures | 8. Specimens |
| 3. Diagrams | 9. Demonstrations |
| 4. Lantern slides | 10. Examples |
| 5. Motion pictures | 11. Illustrations |
| 6. Models | |

The Learner's Function. The learner's function consists, first, in comprehending the directions and specifications of the operation or performance. This part of the work, however, may be done in connection with the preparation of the assignment if no special difficulties are encountered in its preparation. The next step will be concerned with getting the layout of the materials and equipment. And the final step will be largely a matter of procuring the necessary amount of practice to fixate the skill correctly.

Suggestions for Economy in Learning. Gates¹ gives the following suggestions for economy in motor learning. They are quoted verbatim:

1. Make a real study of the characteristics of the function that is to be learned. For this purpose may be utilized:
 - a. verbal descriptions,
 - b. direct observation of good performers or, usually better,
 - c. pictures—especially slow-motion pictures—graphs, or other mechanical aids.
2. Make a real study of your own reactions as you learn. Develop ability to compare your own detailed acts or products with those of others and thereby detect and remove errors, select and practice successes.
3. Do not depend upon formal exercises of parts of a function except where the part offers unusual difficulty; on artificial exercise obtained by being put through a reaction except as a device for assisting observation of the form of the reaction; on the muscular and kinesthetic sensations. When in doubt as to the value of some unusual device, recall the principle: *one learns exactly the reactions he practices.*

The proof of the skill developed and employed in doing a job will be seen in the nature of the finished product, or in the attain-

¹ Gates, A. I., *Psychology for Students of Education*. Revised edition. New York: Macmillan Co., 1930. P. 327.

ment of other goals which are dependent upon skill in manipulating facts, information, devices, tools, and the like

Appraisal, Diagnosis, and Remedial Work. Measurement in motor learning must be largely confined to observation of the movement, detection and correction of errors, and evaluation of the product. A certain amount of diagnostic work must be done. Many inappropriate reactions are introduced in the early stages of learning motor or movement skills. In writing, painting, drawing, tennis, golf, and other skills, the teacher must not only be constantly on the alert for errors but he must also be an expert in instructing the pupil in methods of detecting them. Devices which help the pupil in the identification and elimination of errors will be necessary. Observation is ordinarily a poor method to use to detect errors, unless the learner has been trained to observe the details of a movement. Often photographic views, motion pictures, graphs, diagrams, and other records may be satisfactorily employed to reveal inappropriate responses. Gates² emphasizes the importance of the diagnostic attitude of the learner in motor learning in the following words:

In writing, drawing, carving, diving, tuning handspings and so on the learner must first get the correct position, and second, keep on the lookout for good and bad movements by watching the product, trying at the same time to detect the causes of errors and successes. As he masters the act, the conscious reactions gradually drop out because they are unnecessary.

The following check list will be found helpful in getting the correct movements in performing a motor act.

A CHECK LIST FOR GUIDANCE IN MOTOR LEARNING

- | | | |
|---|-----|----|
| 1. Did you observe a model? | YES | NO |
| 2. Was it a picture of the movement? | YES | NO |
| 3. Was it a living model? | YES | NO |
| 4. Would it make any difference whether the model was a living movement or a lifeless copy? | YES | NO |
| 5. Did it provide a clear idea of what was to be done? | YES | NO |
| 6. Did you artificially practice the movement? | YES | NO |
| 7. Would artificial exercise be helpful in getting the "knack" of the movement? | YES | NO |
| 8. Was the outcome of the performance clear? | YES | NO |
| 9. Did you master the parts of the performance without reference to the whole unit? | YES | NO |
| 10. Did you concentrate on the whole movement? | YES | NO |

² Gates, A. I., *et al*, *op. cit.*, p. 361

- | | | |
|---|-----|----|
| 11. Could you detect any errors in your movements? | YES | NO |
| 12. Could you tell whether you were making progress? | YES | NO |
| 13. Did you ignore the incorrect response when you discovered it? | YES | NO |
| 14. Did you concentrate on the correct movements? | YES | NO |
| 15. Did you employ any mechanical devices to aid in detecting errors? | YES | NO |
| 16. Did you try to get the "feel" of the movement? | YES | NO |
| 17. Did you think it helped you to try to get the "feel" of the movement? | YES | NO |
| 18. Did you compare your movements or rather the products of your movements with those of others? | YES | NO |
| 19. Did you concentrate on the general outcome of your movements? | YES | NO |
| 20. Did you know that one learns exactly the reactions he practices? | YES | NO |

The Outcome—Correct Performance. The chief outcome of motor learning is skill in attaining the correct performance of an act. The product of the activity reveals the character of the skill employed in producing it. If the learner has erred in some particular phase of the movement, the product of his efforts will disclose it. In no other type of learning is knowledge of progress so obvious and stimulating to the learner.

STUDY QUESTIONS

1. What is the importance of manipulative activity in learning?
2. What is the distinction between a play skill and a work skill?
3. What are examples of motor skills? Mental skills? Play skills? Work skills?
4. How does motor manipulation further the activity of comprehending a process or operation?
5. What subject matter or materials are particularly suitable for training the motor skills? The mental skills?
6. Why is interest in mental activity usually more difficult to provoke than in motor or physical activity?
7. What precautions should the teacher take in assigning work for motor performance?
8. What are several conditions which are absolutely essential in the beginning stages of learning of any kind of skill?
9. What are several principles of economy in learning motor habits?
10. Why will measurement in motor learning be largely diagnostic in nature?

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Contains related exercises.

Chapter V ASSOCIATIVE LEARNING

In the two chapters preceding, learning was analyzed as proceeding at times chiefly through direct contact with the external world by means of the use of the sense mechanisms and by exercise of the muscles of the body in actually handling objects, and thus getting an understanding of them through direct contact. These two types of learning were described as observational and motor learning. In the present chapter, learning will be studied from a different angle, that of associating words with their meanings and of fixing in the child's mind the meanings of things with which he has had experience. The school has for a long period forced upon children the learning of set word patterns, such as tables in arithmetic, the spelling of words in writing, and the sequence of words in poetry. These types of learning called for the ability to associate sounds in sequence even though the sounds themselves were not understood by the learner. Memorization and recall were the chief objectives of such a process. It is obvious that there is much occasion for learning of this type. Children cannot play a singing game unless they know the rime that is being sung. They cannot communicate unless they have learned the meanings of common words and the meanings of certain signs of communication such as facial expression and gesture. Wherever people are and things are happening, associative learning is taking place. In observational learning, associations are being formed and meanings recorded; in motor learning, the relations between movements and their meanings are being worked out. Such learnings are largely incidental to the experience. Here

we wish to speak of those specific situations in which the learner is attempting to associate words with their meanings, to associate the forms of symbols of all types with their meanings—in other words, to make the original connections that enable him to enlarge his stock of understandings. This type of learning we shall characterize chiefly as associative learning.

The Nature of Associative Learning. According to our definition, associative learning is that aspect of the learning process in which the learner is attempting to understand and record the relations that exist in the world about him—word sounds with their meanings, people with names, dates with events, land and water forms with the terms which are applied to them, tables of measure with their meanings, names with faces, etc.

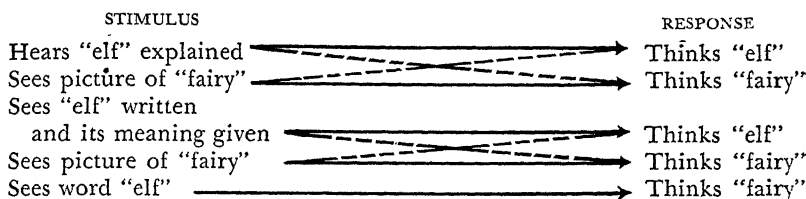
We shall not deal here with the attempts to make permanent such experiences as will be learned in this way. That problem has been discussed in the chapters dealing with drill and with review. Rather we shall deal with the original learning of these data not merely as a type of learning that occurs at times as the main business of the learner but as something just as likely to occur incidentally at any time.

Association is a natural tendency of the mind. Those things which occur together in experience tend to occur together again in memory. Correct and incorrect associations occur in the mind simultaneously. Learning is, in one aspect, the connecting of the associations with one another and the refusing of false associations as they arise. The problem of learning in one sense, then, is that of obtaining the right meanings that should attach to words, objects, processes, and things, and refusing to let the wrong meanings attach to them. It is obvious that at times teachers and pupils are engaged chiefly in learning of this sort.

The Function of Associative Learning. It is rather obvious from the foregoing discussion that the function of associative learning is to record in the mind the meanings of things and to fix these meanings so that when these things are met again they are recognized as having meaning. For instance, a child meets a new word—let us say, “elf.” “What,” says the child, either to himself or to the teacher, “is elf?” Here is a new word sign; here is a new concept. What is the meaning of this sign? The teacher perhaps explains, “An elf is a small person somewhat like a fairy; perhaps it is a kind of fairy.” The child makes an association; he already knows what a fairy is,

more or less perfectly, so he says to himself, "And elf is a kind of fairy."

In the process of developing the idea of "elf," the teacher may explain what it is as she shows the child a picture of a fairy. She may write the word "elf" on the blackboard or present it in written form or in some other manner and at the same time give its meaning as the child looks at the picture. She may continue the process until the child is able to think "fairy" as he sees the word "elf." The diagram shows approximately how the abstraction takes place.



After considerable practice the child associates "elf" with "fairy." In a similar manner thousands of associations are constantly being made between words and their meanings.

The child develops ability to abstract ideas from an early age on. According to the revised edition of the Terman and Merrill test for measuring intelligence,¹ if the child has average ability at six years of age, he can understand correctly number concepts. At the age of seven he can abstract similarities of two things, as wood and coal. At eight he can abstract differences as well as similarities, as airplane and kite, or ocean and river. At ten years of age he begins to find reasons for things, and at eleven he can define abstract words, as "compare" and "obedience." Thus it is seen that ideas grow with increasing age and experience. Learning is a chain of associations, starting with the elemental association between the mother and food and developing into an endless chain, based upon experiences of various kinds which make up the complex thing which we at any moment may call the mind of the learner. It is an important part of the work of the teacher to control the environment of the learner so that it is rich in the possibility of new associations of value and importance. This is a far broader thing than merely having the child learn to repeat a poem or recite the multiplication tables. The latter are fixed patterns of words which are

¹ Terman, Lewis M., and Merrill, Maud A., *Measuring Intelligence*. New York: Houghton Mifflin Co., 1937. Pp. 91-97.

learned and repeated. But first comes an understanding of the meanings of these word patterns, else the learning of words is little better than the mechanical recording of little indentations on the record which the phonograph plays.

Appropriate Situations for Associative Learning. Associative learning, then, obviously occurs in connection with many subjects and with many types of activity and experience. Traditionally there has been a great deal of mechanical association and recording in connection with spelling, language, history, geography, and other school subjects. Oftentimes words have been memorized without meanings and children have come to hate subjects because of the lack of true understanding of them. Today an effort is being made, especially in the social studies, to make these subjects have meanings by connecting them with the present life experience of the child.

Meanings are learned by many methods, including direct contact with things, and associations are enriched by many forms of contact. Beginning with common things about him, the child traces them backward into the past. In the process he learns something of historical perspective and develops historical appreciation and historical sense. Associations are greatly enriched through many types of activity. Associative learning becomes an aspect of rich experience rather than the mouthing of misunderstood verbal signs.

Associative learning is an aspect, then, of many of the school subjects and cannot be thought of as chiefly confined to any one of them. Any subject matter that is studied involves experiences—verbal, motor kinesthetic. These experiences enrich associations, connections between the stimuli, whatever they may be, and the experiences. It is the teacher's part to see that associations are rich with meaning on the child's level, that these meanings are understood and fixed in mind, and that subsequently they are used in understanding new situations which arise.

Securing Interest. Associative learning is more effective and certain when the subject or the experience is of great interest to children. Children seek for meanings when they are concerned with them in some useful way. If the subject is literature, then the literature must be within the grasp of the children. Likewise, in connection with any subject, if it is desired that children learn new words that are needed in the communication of ideas, then those new words must be related to the children's activities and interests. This

is the law of motivation for associative as well as other types of learning. No extrinsic type of motivation can be valid. The motivation must come from the subject or activity itself.

Directing Associative Learning. In a lesson where the teacher especially wishes to increase the child's stock of associations, there must be skilled direction of the child's attention to the associations which he wishes him to achieve. An assignment of this type may be illustrated from the subject geography. The child wishes to know what a desert is and why there is so much sand there; why there is no water; why it is so hot. The teacher then makes an assignment which directs the child to the observation of some pictures; perhaps he uses a projector and a screen, some maps and maybe a physical experiment to furnish concrete data. He then directs the child's study by a series of questions or problems.

1. What do you notice about the sky in a desert?
2. What do you notice about the land forms?
3. What do you notice about the plants?
4. What do all these things suggest?
5. What does the map show you about the rainfall?
6. What does the map show you about winds? Mountains? Ocean currents?
7. What then do you find associated with the word "desert?"
8. What is a desert?

Throughout the study, the teacher directs the child to data which will furnish him with rich meanings about the desert, and he learns to associate with the term those phenomena of nature which give to the word "desert" a meaning. The accuracy of his knowledge depends upon his power to make correct associations in the first place and to interpret the data in the second. The making of the associations constitutes the associative learning part of the experience and the solving of the problem is, in effect, a more advanced type of thinking which is discussed in a later chapter.

The Class Activities. In a situation in which associative learning is dominant, what is likely to be the type of recitation activity, if any? The answer is indicated in the preceding paragraphs. There are likely to be observation, discussion, and seeking for meanings and understanding. There may be an attempt to fix these meanings in memory through drill. More likely, however, there will occur enriched experiences with attempts on the part of the teacher to develop and draw out these experiences. There may be reporting of

data, reading from books and magazines, the study of pictures, films, or other data, and a definite attempt to seek the meanings of things observed and to get correct ideas from the data under consideration. In the old school there might have been a great deal of verbal memorizing and drill. In the new school the latter is likely to be individualized and to be confined to a work period rather than to discussion and recitation.

Appraisal of Results. How may the teacher evaluate a learning situation in which the activity is chiefly associative learning? There are certain criteria of achievement which may be employed.

1. Is the material to be learned related to the experiences of pupils?
2. Are sufficient data—pictures, objects, printed matter, etc.—being used to contribute definite meanings to the pupils?
3. Is the teacher attempting to direct the child's efforts to discover meanings or is he merely telling him what to remember?
4. Is the child definitely observing, questioning, examining, comparing, and evaluating the data under observation?
5. Are the children led to discover meanings and to note them rather than to memorize meanings which are given to them by the teacher?
6. Are the meanings under consideration sufficiently important to deserve the effort?
7. Are there evidences that the children appreciate the value of the meanings that have been developed?

Outcomes. The outcomes of exercises in associative learning are enriched understanding of words, symbols, processes, etc. The purpose of such exercises is to furnish pupils with more adequate concepts of words, objects, processes, and relationships. Children's powers of observation, evaluation, comparison, and conclusion are enriched. Chiefly, however, the attention is centered on the achievement of accurate associations and understandings. The skill of the teacher lies in having these understandings and associations achieved by the children rather than simply given them verbatim and memorized without understanding. It is rarely that arbitrary associations of words, signs, and symbols are necessary.

STUDY QUESTIONS

1. What is the particular significance of associative learning as it is discussed in this chapter?
2. In what period of childhood are new associations most plentiful and most confusing?
3. Does associative learning occur isolated from other aspects of learning?

4. What is the chief function of associative learning in the life of the individual?
5. What types of associations are common to different subjects?
6. It has sometimes been said that teaching a child to read is teaching him to associate words with their meanings. Develop this idea.
7. Show how meanings of words may develop.
8. State the chief value of subject matter in associative learnings.
9. Discuss motivation in relation to associative learning. Must all learning of this type be motivated by efforts of the teacher?
10. What type of assignment is necessary when the problem is chiefly one of associative learning?
11. What types of activity are likely to characterize a recitation devoted to associative learning?
12. How may the student evaluate an activity which involves associative learning predominantly?
13. What are the outcomes of exercises in associative learning?

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Chapter VI PROBLEM-SOLVING

Problem-solving, or reflective thinking, is regarded by many as the type of mental activity toward which all simpler types of learning lead. It requires ability to reason, which is the distinguishing characteristic of intelligent activity. It may be thought of by the uninitiated as occurring chiefly in mathematics; but it will become obvious that mathematical problem-solving is only one of the many forms which problem-solving may take. It occurs in all school subjects and in most life situations. In the school curriculum the social and natural sciences afford particularly rich opportunities for the exercise of reasoning.

The method by which problems are solved is, in effect, the scientific method. It is at the same time the most difficult and the most important method of thinking and learning. Ability to solve the problems which confront him enables man to exercise control over his activities and his environment. Without it he is at the mercy of nature and can make no intelligent social progress.

Teaching children to think is one of the most difficult and important tasks of the teacher. The fact that more children do not learn to think effectively can be attributed to the large emphasis often given to the rate of learning and the development of routine habits, and to the failure of the curriculum to provide opportunities for problem-solving through reflective thinking. This difficulty will be overcome when a more functional curriculum is provided and the teacher is encouraged to develop the art of independent thinking both for himself and for his pupils.

Definition of Problem. A problem occurs in a situation in which a felt difficulty to act is realized. It is a difficulty that is clearly present and recognized by the thinker. It may be a purely mental difficulty or it may be physical and involve the manipulation of data. The distinguishing thing about a problem, however, is that it impresses the individual who meets it as needing a solution. He recognizes it as a challenge, either highly interesting and suggesting immediate action, or at least as a difficulty which ought to be solved by somebody.

Problem and Project Differentiated. Problems and projects are so often spoken of together that it seems necessary here to distinguish between the two terms. Wilson and Wilson¹ distinguish between them as follows:

But even a thoroughly motivated problem is not a project. The problem may be solved in thought only, while the project requires the completion of some objective piece of work based upon a problem or a series of problems. The difference is that the problem solution may end in thought, while the project can end only with the successful completion of an objective unit of work.

This statement probably represents the most obvious difference between a problem and a project. The latter is clearly a more purposeful and constructive activity. It embraces problems, both intellectual and physical.

Outstanding Characteristics of Good Problems. The outstanding characteristic of a problem, then, is the existence of a difficulty, mental or physical, which demands reflective thinking on the part of the learner. There are, however, both good and bad problems, speaking from the point of view of the teacher and the child. A good problem for teaching purposes is clear, definite, interesting, thought-provoking, understandable, suitable, and of practical value. It strikes the child as worthwhile.

A Score Card for Evaluating a Problem. It may be interesting for the reader at this point to attempt to evaluate problems more or less definitely. For that purpose a tentative score card is presented below. The criteria for judging a problem are the characteristics noted in the preceding paragraph. When evaluating a problem, first read it carefully and then evaluate it on the following card:

¹ Wilson, H. B., and Wilson, G. M., *Motivation of School Work*, revised edition. New York: Houghton Mifflin Co., 1921. P. 251.

A Student's Score Card for Evaluating Problems

CRITERIA OF A GOOD PROBLEM	PERFECT SCORE	STUDENT'S SCORE
1. Clear Free from language errors and ambiguities.	10	
2. Definite Can be defined, or limited to a particular difficulty.	10	
3. Valuable Impresses the learner as being important.	10	
4. Interesting Incites, urges, or drives to action, such as curiosity, manipulation, etc.	10	
5. Thought-provoking Challenges the learner to mental activity.	10	
6. Comprehensible Involves language and thought difficulty within the learner's capacity.	10	
7. Suitable Related to learner's experience and suited to his abilities.	10	
8. Practical Deals with a practical situation. Knowledge and skill gained is usable in other situations and the solution of the problem is worthwhile.	10	
Total Points	<hr/> 80	

It is a good plan first to think of the characteristic which the problem has to a most pronounced extent. Give this characteristic a value of ten. Then assign values in decreasing amounts to each of the characteristics which the problem possesses to a lesser extent. A perfect problem would score eighty, for each characteristic of such a problem would receive as high a score as any other. Try this card on the problem questions appended to this chapter. Compare your rating of problems with those of other students whom you may know.

Exercises in Problem-Solving. The act of problem-solving will be perhaps best understood if the reader will attempt to solve the following problems and then immediately analyze the processes by which the problems were solved.

1. If three cats can catch three rats in three minutes, how many cats can catch one hundred rats in one hundred minutes?
2. A boy is sent to the well to get exactly seven pints of water. He has a

- four-pint measure and a nine-pint measure. He is to begin by filling the four-pint measure. How shall he measure out exactly seven pints?
3. The man who made it wanted to sell it. The man who bought it never used it. The man who used it never saw it. What is it?
 4. A steel band is placed around the earth at the equator so that it fits tight. The band is cut and thirty-six additional inches are put in. How far would the new band stand out from the surface of the earth, assuming π to be exactly 3?
 5. A farmer brought five pieces of chain, of three links each, to a blacksmith and asked the cost of making them into one chain. The blacksmith replied, "I charge one cent to cut a link and one cent to weld a link." The farmer remarked that as it would require four cuts and four welds, the charge would be eight cents. "No," said the blacksmith, "I figure it but six cents." Show how this could be done by cutting three times and welding three times.
 6. Use me well and I am everybody. Scratch my back and I am nobody. What am I?

In the solution of riddle number 6, see if you can detect appropriate methods of procedure. First of all, attempt to find objects which must be handled with considerable care for service, such as, for example, automobiles, telephones, radios, refrigerators, chairs, books, mirrors, lamps, vases, etc. Then, begin to eliminate those objects which do not have backs, such as lamps, and vases, for it is a condition of the problem that the object must have a back. Continue the process of eliminating those objects whose service or usefulness is not impaired by having their backs scratched. See now if you can find the object which best answers the conditions stated in the problem. A careful analysis of this puzzle problem will show that many of the principles involved in problem solving are present. These are stated and briefly discussed in a later section of this chapter.

Types of Problems. In schools, teacher and pupils meet all kinds of problems, intellectual, social, and manual. Every subject has its problems. To list and define each of these types of problems would take more time and space than are available in this book. The puzzle problems presented in the last section are more or less play problems which many people enjoy for recreational purposes. Perhaps more important than these from an educational standpoint are social problems of various sorts. History and geography present many such problems. A few will be given here to illustrate:

1. Why is transportation by water usually less expensive than that by railroad?

2. Why are farmers in Illinois usually more prosperous than farmers in Vermont?
3. Why is Pittsburgh a larger city than Indianapolis?
4. Should the United States insist on maintaining the open-door policy with reference to China?

To present the subjects of history and geography so that such problems as these are met and solved is to give interest to the study of the subjects, and at the same time to train the student in the art of reflective thinking.

There are also involved in school life many practical problems which furnish excellent opportunities for teaching pupils to think. Such problems as these are met constantly.

1. How shall we raise money for a memorial which we wish to present to the school at graduation?
2. What kind of play shall we give?
3. How shall we raise money in order to help boys and girls have milk who are now unable to get it?
4. How can we make our room appear better?

These and a thousand other problems like them are seldom thought of by teachers as affording opportunities for teaching children the art of problem-solving, but as a matter of fact they are problems par excellence.

The Statement of Problems. Problems may be expressed in a variety of ways: as questions, propositions, purposes, or topical outlines. Examples of these are:

1. A question: Why are the farmers in Iowa more prosperous than the farmers in western Canada?
2. A proposition: Farmers in Iowa have a better opportunity to become prosperous than farmers in Wyoming.
3. A purpose: To find out whether Iowa farmers have a greater opportunity to become prosperous than farmers in Illinois.
4. A topical outline: The prosperity of Iowa farmers: cause of, extent of, factors interfering with, measures needed to improve, etc.

There are no doubt other forms of statement which might be suggested, but that is not necessary, for it is not the form or type of problem that is important to the student; it is rather an understanding of the essential nature of problems that is significant.

The Two Major Functions of Problem-Solving. Exercises in problem-solving are necessary for two major purposes: (1) to develop in the child the art of reasoning and (2) to give him practical knowledge

and skill valuable in life. Problem-solving should not be taught in and for itself alone, but rather as a means of reaching the solution of real difficulties which make some difference to the learner. Exercises in problem-solving should teach the pupil to locate and define problems, to seek tentative solutions of these problems, to try out these solutions until one of them is selected as the true one, to verify this solution, and finally to apply the solution in his life activities. Much problem-solving stops short of the last step in this series. From experience in reflective thinking the pupil will gain power to meet new situations, to analyze them, and to solve the difficulties in them through the use of a systematic procedure. This procedure is the inductive-deductive method, the art of reasoning, or the power of reflective thinking. It is important to remember, however, that real problems give this power more than unreal problems not related to the child's experience.

Neither children nor adults engage in problem-solving except for some definite purpose. The function of problem-solving is to enable them to realize this purpose, whatever it is. Some of the purposes which may move teacher and pupils to attempt problem-solving are as follows:

1. To learn the art of problem-solving
2. To learn how to do something
3. To discover new knowledge
4. To escape the consequences of some act
5. To learn how to act in a new situation
6. To learn how to make something
7. To solve a puzzling mental problem
8. To get out of a difficult situation
9. To learn to suspend judgment
10. To learn to define and limit problems
11. To learn how to find solutions
12. To improve judgment
13. To verify an opinion
14. To discover a new process
15. To invent a new device
16. To create a new idea
17. To improve knowledge
18. To entertain others
19. To help another solve a problem
20. To satisfy curiosity

It is the function of problem-solving to aid both teacher and pupils to satisfy such purposes as are suggested above. It is the work of the

teacher to create situations in which real problems, involving purposive action on the part of the pupils, will be often met.

Teaching problem-solving or reflective thinking is now thought to be one of the most important functions of the teacher and the school. Ordinarily it is now carried on by the use of the problem method, which is, in effect, simply the method of approaching a subject or an activity as a series of problems.

Subject Matter. An investigation of the curriculum of the past will show that mathematics and certain fields of science were the only ones in which problem-solving was seriously practiced because in these areas problems were commonly included in the textbooks. For a long time these subjects provided the most opportunities for the exercise of the reflective thinking type of learning. It is now more common for teachers to employ problem-solving outside of these fields. History and geography, civics and health education, offer many opportunities for problem-solving. Likewise, other so-called content subjects contain much material suitable for this purpose. Examples of the problem approach are numerous in many of the newer type of textbooks for the elementary school. The Thralls-Reeder geography is a good example of teaching the subject by the problem method.² These newer types of materials are noticeable for the inclusion of the abundance of problems in them. Thus it seems that one of the fundamental purposes behind the better types of teaching in these subjects is to teach children to think reflectively.

Making Problem-Solving Interesting. The very fact that a great deal of useless subject matter has been eliminated from the curriculum makes the task of motivating schoolwork less difficult today than formerly. Some persons believe that the problem method has been largely responsible for making classroom work worthwhile and interesting to children in spite of the fact that the conventional school curriculum still retains obsolete material and encourages outworn methods of procedure. Modern textbooks written on the problem basis are sufficiently interesting in themselves to vitalize schoolwork for the average child. If, however, the textbook fails to supply the necessary challenge for children, the teacher must make good the deficiency. He may do this by creating problem situations in which children feel the need for doing something

² Thralls, Zoe, and Reeder, Edwin H., *Teaching Geography in the Elementary School*. Chicago: Rand McNally & Co., 1931.

worthwhile. Oftentimes a real problem is all that is needed to supply the motive for launching into an activity. Wilson and Wilson, in their *Motivation of School Work*,³ show how a real problem may be created in geography. It is interesting to observe how detailed their technique is for this purpose. It is, in part, as follows:

Under the study of shelter, the gradual advance from the log cabin to the present splendid homes was noted carefully, and then the work and questions involved in building a house today were taken up. Where is wood obtained? Where was more of it obtained formerly? Why? How was it formerly prepared for use in building? How is it now prepared? What kind of wood was used for building formerly, and at the present time? Notice the rafters and joists in a very old house, and compare with the sawed yellow pine in a new house. Where do we get the yellow pine? What would you see if visiting a lumber camp in Mississippi? Where do we get the red-cedar shingles? What was formerly used? In the same way attention was given to other materials, nails, plaster, glass, etc.

The study of fuel led to the realization of the fact that wood was formerly used as the only fuel; that forests were ruthlessly destroyed; that at present there is a scarcity of wood; and that prices are high accordingly. Coal is now the chief fuel of the community. The effort was made to find out about this fuel by visiting coal yards, by making inquiry as to the source of the coal supply, by making an imaginary trip into the coal fields of West Virginia, by going down into a coal mine, and possibly by coming to know some of the fellows who worked day after day in mining the coal which was burned in their grates and furnaces.

In a similar way and as thoroughly as third-grade pupils were able to do so, the present method of lighting as compared with former methods was studied.

An Illustration from History. History can be motivated by attacking real problems in which children re-enact and relive the deeds and events of the past. This is excellently shown in the work⁴ just cited. Such undertakings as the following, mentioned in connection with motivating history, contain problems in abundance to challenge the child to think: writing imaginary diaries of great men and women; making supposed speeches of statesmen; representing a constituency in the Legislature or Congress; preparing to debate some questions which are before Congress for settlement; dramatizing scenes and

³ Wilson, H. B., and Wilson, G. M., *Motivation of School Work*, revised edition, New York: Houghton Mifflin Co., 1921. P. 251.

⁴ *Ibid.*, pp. 101-32.

stories; arranging pageants; making special reports; gathering information from the library; bringing something of historical interest from home; reading stories of adventure; and similar activities. There is, in fact, almost no end to the problems which history offers for motivating thinking. Other subjects of the curriculum have their problems which are particularly challenging and interesting. Motivation is easily obtained when vital problems, related to the child's experience, are attacked.

Large Units More Easily Motivated. Usually the motivation of large units of subject matter is less troublesome to the teacher than the motivation of small or daily units. This is the chief reason why the teacher should organize subject matter in the form of problems, projects, or units of work. A few of the commonly employed types of activity which are replete with opportunities for challenging problems are suggested below for analysis and study. The student should attempt to add others to the list.

1. Making excursions
2. Tabulating data
3. Presenting pageants
4. Dramatizing stories and events
5. Telling stories and anecdotes
6. Making booklets
7. Organizing a town council
8. Writing speeches for a convention
9. Charting data
10. Making statistical tables
11. Graphing data
12. Making products maps
13. Doing a type of research work
14. Constructing practice exercises

The Assignment in Problem-Solving. Problem teaching requires considerably more work on the part of the teacher in making assignments than most conventional methods of assigning lessons. The reason for this is obvious. The teacher cannot merely assign pages and chapters promiscuously from textbooks for the next lesson without a preliminary thinking through of the problem and a planning of the procedure. Definite reference to materials must be found, tentative statements of problems must be made, and plans for creating the problem-solving situation must be formed. The problem may then be raised and discussed and the assignment made. This practice demands exceptional skill and adaptability.

Many teachers are very skillful in getting pupils to accept a series of problems already organized in the form of lesson units; others are adept at developing problems with pupils and then suggesting materials which will aid in their solutions. The latter practice is more desirable, in most instances, but it is a more involved enterprise than the former. Making the assignment in problem teaching thus entails a great deal more work on the part of the teacher than merely giving a page assignment from a regular textbook in the ordinary way. It necessitates careful study of materials, their organization, and the collection of definite references of a variety of types.

Since problem teaching generally assumes large units of work, the making of the assignment is not ordinarily a daily affair. It may take considerable time in the early stages of initiating the problem before the assignment can be adequately made; then the same assignment may hold over for a period of time with only supplementary directions indicated now and then as the teacher deems advisable.

There are a number of factors to be considered in making the assignment in problem-solving. First of all, there is the necessity of knowing something about the ability of the group to study in a variety of situations. Then there is to be considered the difficulty of the subject matter involved in the problem. Besides, such factors as availability of reference materials, the effectiveness of habits of study, and the ability to forge ahead or make a reasonable amount of headway from time to time will have to be taken into account. In fact, pupils who do not possess a great deal of independence in habits of study will have to be skillfully guided, at least in the beginning stages of problem-solving. If out-of-class assignments are necessary at times, they should be very definitely stated. Otherwise much time and effort will be consumed by pupils in searching for data pertinent to the solution of their problems. Usually it is best to break the major problem into its elements or subproblems for specific attack by each pupil. Definite and detailed references to materials should be made. The capable pupils should be assigned special tasks to supplement the work of the average group. Each pupil must know definitely what he is looking for and how to find it. All must be responsible for making an earnest effort to find answers to their problems and in preparing for the group discussions which follow.

General Techniques of Assignment Suggested. These conditions de-

mand a teacher skilled in the technique of assignment. Yoakam⁵ suggests a number of factors in which teachers must be adequately trained in order to make successful assignments. Among the techniques which need emphasis, as he sees them, are:

1. *Arousing Interest.* The teacher must supply the challenge if the textbook does not. A number of devices for this purpose have already been suggested.
2. *Relating the Old to the New.* Bridging the gap between the known and the unknown is a gradual process involving comment, questions, problem-raising, conversation, storytelling, etc. Observation and practice are essential factors in learning the technique.
3. *Raising Problems and Questions.* Observation of good models and practice are also essential to the attainment of skills in this technique. Self-activity is necessary and should be encouraged.
4. *Giving out References.* References should be given in detail so that children may find their materials with a minimum of time and effort. Teachers should know how to use reference guides themselves as well as how to make bibliographies.
5. *Making Printed, Typewritten, and Hectographed Copies.* Teachers should understand how to operate duplicating machines so that they may make their own assignment sheets, outlines, and lists of references.
6. *Using Ready-made Practice Materials.* These are not only helpful in making assignments but they are also valuable for ideas about materials which may be organized into assignments. Practice materials for many school subjects are available in commercial form.
7. *Individualizing Instruction.* Teachers should know how to make unit plans, or to differentiate assignments according to children's ability to make reasonable headway in their preparation. Devices such as are now employed in the Daltonized schools will be found helpful in this respect.

Activities of the Class Period. Generally, the class activity involved in problem-solving consists of stating and defining problems, reporting data gathered, and discussing the solutions of the problems raised or formulated through the cooperative thinking of pupils and teacher. It is a group affair in which pupils find an enriched opportunity to do reflective thinking. They suggest tentative solutions of problems and give supporting data. They compare and evaluate these different solutions, and when the solutions are unsatisfactory they do additional searching for data according to the directions indicated by the teacher. New problems arise which

⁵ Yoakam, G. A., *The Improvement of the Assignment*. New York: Macmillan Co., 1932. Pp. 120-41.

require further research and study for their solutions. Sometimes practice or drill will be found necessary in order that pupils may carry on their work successfully. Throughout the recitation, pupils maintain a tentative attitude about their data and inferences, and suspend judgment until sufficient data are collected to warrant making conclusions.

Steps in Problem-Solving. While there is no rigid formula that will insure success in problem-solving, the following steps will be found suggestive of activities in which pupils may be reasonably expected to engage in solving a problem:

1. *Raising the Problem.* This is an assignment activity and a phase of the recitation. The problem may be stated first, and then interest aroused in it, or it may be developed from a discussion of experiences which have previously been undergone by children. If the statement of the problem is sufficient to challenge pupils to attempt its solution, further attempts to arouse interest in it would seem to be unnecessary. Usually, raising the problem requires considerable questioning and discussion covering the situation out of which the problem will eventually arise. Sometimes several class periods may be used in preparation for investigation and study. No rigid rule can be followed; no infallible way of doing this can be stated. The teacher must see to it that the problem gets before the children in such a way as to arouse their interest and challenge them to study it.
2. *Interpreting the Problem.* The teacher may explain the problem in detail when presenting it to the class, or the pupils may interpret it through discussion. The nature of the assistance that will be necessary from the teacher depends largely on the difficulty of the problem and the ability of pupils to make a reasonable amount of headway in their interpretations. It is too much to expect of young children that they shall invariably define and limit their own problems. Older children should gradually develop much initiative in interpreting new problems that arise.
3. *Gathering and Evaluating Data.* After pupils have grasped the meaning of the problem, they must then be stimulated to gather and evaluate data for its solution. The teacher must provide ways and means of getting them to search for suggested solutions. She must indicate sources, or pupils must discover them for themselves by reading, studying charts, graphs, statistical tables, pictures, etc. If pupils have difficulty in recalling quickly and accurately all they know about the problem, effective aids may be employed, such as clues, or substitute activities. Sometimes crutches and mnemonic devices may facilitate recall. But these are not always practical nor effective. When pupils have gathered all the data they can, they may be asked to state several hypotheses. These are valuable in furnishing "leads" to additional data. As materials are gathered and assembled, it will be nec-

essary to evaluate them. Superficial materials must be eliminated and only the pertinent data included. Then the next step in solving the problem becomes important.

4. *Formulating Tentative Solutions.* All inferences bearing on the data at hand must be considered tentatively. Judgment must be suspended until sufficient data are gathered, evaluated, and organized in a systematic manner to further the solution of the problem. When reasonable time has been permitted for purposes of evaluating the various tentative solutions, the true solution should become apparent. It should be stated, right or wrong, by the pupils. This phase of problem-solving demands an unusual amount of guidance and patience on the part of the teacher. He must suggest solutions and inferences in a judicious manner without injuring the feelings of those who jump carelessly at conclusions. Incorrect conclusions cannot be dogmatically rejected, for this kills enthusiasm and fosters antagonism among those pupils who try but are unsuccessful.
5. *Verifying the Results.* When the class has accepted the conclusion which is most likely to be the best one, steps must be taken to prove its correctness. This may be done in a variety of ways: (1) by applying the hypothesis to new situations; (2) by experimenting further with it; or (3) by gathering new data through study and investigation.

Parker's Suggestions. Parker⁶ suggests the following plan for the teacher to employ in stimulating and assisting pupils to carry on reflective thinking:

1. Have pupils define the problem at issue and keep it clearly in mind.
2. Encourage them to recall as many related ideas as possible.
3. Have them evaluate the suggestions as they arise.
4. Help them to organize their material so as to aid the process of thinking.

Dewey⁷ expresses about the same idea in his analysis of a complete act of thought, in which he advocates the following procedure:

1. Create a felt need to do something.
2. Locate and define the difficulty.
3. Attempt several possible solutions.
4. Develop the suggestions sufficiently to indicate the ways in which they apply to the data at hand.
5. Continue making further observations leading to the acceptance or the rejection of the solution.

One of the most valuable treatments of problem-solving in print is to be found in Lyman's book *The Mind at Work*. This book

⁶ Parker, S. C., *Methods of Teaching in High Schools*, revised edition. Boston: Ginn & Co., 1920. Pp. 185-98.

⁷ Dewey, John, *How We Think*. Boston: D. C. Heath & Co., 1910. Pp. 68-78.

contains an excellent analytical treatment of the important mental activities involved in problem-solving and suggests valuable references. The student should read this work to enrich his knowledge of the subject. The reference is still one of the best on this phase of problem-solving.

The Use of Measurement. Ability to solve problems is difficult to measure with any degree of accuracy. Usually the solution of a problem is the test of success. If pupils are carefully directed in their evaluation and organization of data and are required to verify each step in the process, they should reach the desired outcome—the solution of the problem. There may be a need, however, for administering tests of certain types to check on the use of problem-solving skills and the application of ideas gained to new situations. Objective tests may be devised and administered for this purpose. Many of these are discussed in Chapter XX of this book. Often a well-prepared written report of the progress made in working out the problem will take the place of an examination; or better still, a check list designed to call the learner's attention to the essential elements of problems and their solutions may be employed by the student. Such a check list is suggested here as a model for study and use.

A STUDENT'S CHECK LIST FOR JUDGING PROBLEMS AND THEIR SOLUTIONS

Directions. Encircle "yes" if you observed any of the following conditions in solving your problem; encircle "no" if you did not observe them.

- | | | |
|---|-----|----|
| 1. Did the problem originate with the class? | YES | NO |
| 2. Were you a partner in originating it? | YES | NO |
| 3. Did you accept it without any reservations? | YES | NO |
| 4. Did it fulfill a need or purpose? | YES | NO |
| 5. Were you enthusiastic about it? | YES | NO |
| 6. Was the problem related to any previous experience that you had? | YES | NO |
| 7. Did you make contributions toward its solution? | YES | NO |
| 8. Did you have any difficulty in gathering your data? | YES | NO |
| 9. Did you know where to obtain data for your problem? | YES | NO |
| 10. Did you feel that the problem was yours as well as a class problem? | YES | NO |
| 11. Did you know when you had discovered pertinent data bearing on the solution of the problem? | YES | NO |
| 12. Could you evaluate and organize your data so that you could arrive at an answer to the problem? | YES | NO |
| 13. Were you continually guessing at the answer? | YES | NO |
| 14. Did you often make inferences that were wrong? | YES | NO |

- | | | |
|---|-----|----|
| 15. Did you know when you had made a correct inference? | YES | NO |
| 16. Did the class agree on the correct solution of the problem? | YES | NO |
| 17. Did you agree with other members of the class on the correct answer? | YES | NO |
| 18. Was much additional study required before the final answer to the problem was decided upon? | YES | NO |
| 19. Did the class verify the solution of the problem? | YES | NO |
| 20. Were further investigation and study necessary in order to verify its solution? | YES | NO |
| 21. Could you use any of the knowledge gained through your study of the problem? | YES | NO |
| 22. Could you think of a more desirable problem for the purpose for which it was used? | YES | NO |
| 23. Has your ability to think been improved as a result of your study of the problem? | YES | NO |

In his *Appraisal of Newer Elementary School Practices*, Wrightstone⁸ reports the use of anecdotal records, descriptive inventories, questionnaires, etc., in measuring initiative, cooperation, criticism, leadership, and other characteristics of children's personalities.

The Permanent Effects of Training. Problem-solving develops the ability to criticize suggestions in an open-minded and unbiased manner, the ability to assume a tentative attitude about matters which have not been entirely settled on account of insufficient data at hand, and independence in general habits of study. Pupils learn to plan because they assume the responsibility of doing some research in an effort to make important contributions to the class. They learn what is relevant and what is not from group discussions. And there is always something to do for the next day's lesson because so many subproblems and unexpected difficulties arise from the discussion of data collected. All these abilities integrate into the one large ability to think independently.

STUDY QUESTIONS

1. What is a problem situation? Give illustrations from life.
2. What are the chief features of a good problem?
3. Why are problems often difficult to formulate in some school subjects?
4. What is an example of a good problem in history? In geography?
5. Why are problems often vitalizing factors in school work?

⁸ Wrightstone, J. W., *Appraisal of Newer Elementary School Practices*. New York: Bureau of Publications, Teachers College, Columbia University, 1938. Pp. 180-81.

6. Why are assignments usually difficult to make in problem teaching?
7. Why are large units of activity more challenging than short units?
8. To what extent does problem teaching encourage research work?
9. How does the problem you selected from history and geography fit in with criteria given in the score card?
10. Why is the written report a more satisfactory measure of the success of problem-solving than other kinds and types of tests?
11. What is the value of a check list in problem-solving?
12. How would a check list for solving ready-made problems differ from one for problems to be formulated by the class?

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Chapter VII EXPERIMENTAL LEARNING

Research, or search for and discovery of new information, is a form of learning which should not be thought of as limited to the graduate school, for much of the learning that actually takes place in the kindergarten and primary grades is of the experimental type. It is a significant fact that the experimental method may be used to some extent, at least, in learning every school subject and in every grade of instruction. The method requires that the learner shall be permitted to discover things for himself, that he experience conditions as they actually are, and that he formulate his own inferences and conclusions from the data obtained in making his observations. Considerably more emphasis may profitably be given to this method of learning in all grades of instruction.

The Experimental Method Inductive. As the name implies, experimental learning is learning through one's own experiences. It is a form of problem-solving, or reflective thinking. It is a searching for actual truths about things and processes, the main value of which lies in the fact that pupils learn through its use to discover things for themselves, rather than having them told outright by the teacher or discovering the answer in some text or reference book. It is a method of learning which has been characterized as the scientific method. The principle underlying the theory holds that pupils must learn to arrive at definitions, processes, operations, and rules through controlled experience, and not merely by memorizing them from books or from dictation by the teacher. By this method of learning, the pupil should proceed from the particular instances to the general conclusion rather than from the general conclusion

to the particular instances. This makes the process different from the problem method as outlined in the previous chapter in that it emphasizes discovery of truth by the scientific method, rather than simply arriving at truth through the process of reflective thinking alone.

Experimental Learning Controls the Situation. The true essence of experimental learning is found in the possibility of actually controlling the experimental situation and trying out one experimental factor after another until the one producing a certain effect is found. For instance, the experimenter may wish to observe any one of the following factors:

1. What is the effect of introducing water into the carburetor of an automobile?
2. What kind of gasoline is best for ordinary use in my car?
3. What will happen if I push this swing up as far as the eaves of that barn?
4. What will mother do if I stay out later than I did yesterday?

Any one of these problems suggests not only thought but action. It is indicated that the experimenter should do or try something. This is what makes experimental learning supplementary to reflective thinking about problems of various sorts. The thinker may go through the inductive-deductive process until he has the answer to a problem, as far as he can reason it out. Experimentation will enable him to prove whether or not his solution is the correct one. Experimentation is then a kind of adventuring into the unknown and that is what gives it its challenge.

In solving the first of the problems suggested in the preceding paragraph, for instance, the method of the experimenter is clear. The thing to do is to start an automobile to running, to obtain some water, to devise a means for introducing this water into the carburetor while the engine is running, actually to introduce some water, and to observe the results. The result observed is the answer to the question. This constitutes a simple experiment that anyone might try. What happens to the learner while such an experiment is going on?

Experimental Learning and Scientific Method. In experimental thinking or learning the experimenter is learning to proceed scientifically. He is going through a process of reflective thinking, but he is checking every step of his thinking by the most objective means he can find. He locates a problem and defines or limits it;

he develops a hypothesis or hypotheses as to the solution of the problem; he creates an experimental situation in which he exercises control over these tentative solutions; he tries out the effect of each and measures it; he isolates each one of these factors and keeps it from being affected by others; finally, he comes to a conclusion or fails to come to a conclusion as the case may be.

All through this process he proceeds according to certain well-known principles that distinguish the scientific thinker from the nonscientific. He is tentative-minded; he seeks to refrain from influencing the results to bring about a solution in which he is interested; he refrains from bias; he keeps careful records; he is objective; he measures the effect of each of the experimental factors carefully; he draws his conclusions from the data and not from unsupported opinions and prejudices. He learns to proceed as the scientist in the laboratory. Through the process of experimentation, he engages in experimental learning and the outcomes of the process are conclusions—laws, rules, principles, truths that he can use in his subsequent thinking. At the same time he is achieving a method of thinking, a way of working, a tool of learning; and he is perfecting his ability to use it effectively.

Experimental learning, therefore, is discovering truth through subjecting problems to controlled action in which the probable answers to the problem are tried out and the true solution ascertained.

The Discovery of Truth by Experimental Learning. The chief function of experimental learning is the discovery of the truth—the formulation of a sound conclusion from observable data. It inevitably leads to generalization, to a principle or a rule. Pupils become more analytical and objective in their methods of investigation and study, for they are required to test critically any hypothesis before generalizing. They learn to plan an actual experiment and to carry out the experimental process.

It is quite probable also that pupils retain more permanently what they learn by the experimental method than by other methods of learning. This fact can be partially explained on the supposition that pupils understand a principle or a process better when they discover it for themselves, and that experimental learning is essentially an active process. This is illustrated in the discovery of the principle of osmosis, commonly demonstrated by the simple egg experiment. In this experiment the active process of discovering

things enables children to understand more fully the practical value of a generalization. Instead of dictating the principle of osmosis to children or having them read it from a book, the teacher provides an experimental situation in which children investigate and discover conditions causing the diffusion between two liquids of different densities separated by a permeable partition or membrane. Children thus learn experimentally a principle, a law, or a rule instead of merely memorizing it from dictation or books. This is the more generally approved method of developing generalizations.

The aim of this method of learning is most effectively realized when pupils tend to try out their hypotheses about things, to read experimental literature, and to apply the method to a variety of situations in everyday life. It should be employed with considerable care, for it is obvious that children can get into trouble through unwise experimenting, and that many problems are yet insolvable by this method. Some rules and laws must be accepted without proof. It is unnecessary to repeat all experiments that have been devised to develop principles. Exercises in experimental learning are advisable, however, to introduce the child to one of the most important means of discovering truth.

Appropriate Subjects for Experimental Learning. Experimental learning is possible in almost any subject, but it is obvious that it especially characterizes the experimental sciences. In elementary and general science, geography, physics, and chemistry, the method is frequently used. It may also be employed in the social sciences, even though there it is harder to control and perhaps may lead at times to false conclusions. In literature, music, and art it is properly used; also in the industrial arts.

True experimental learning requires problem situations, in which pupils are permitted to investigate and try out the effects of different possible solutions with a view to formulating their own conclusions. Such subjects as biology, chemistry, physics, and general science provide many occasions for the experimental type of learning, although these subjects have been traditionally organized for the more formal method of deductive approach. The task of adapting the materials of these subjects to the more modern way of experimental study constitutes an important obligation on the part of the teacher. If the textbooks in use do not contain problems for investigations and study, the teacher must analyze the materials with the view to creating situations for experimental learning.

Examples of materials suitable for the experimental type of learning are suggested below for study.

1. What is the effect of sunlight on paint?
2. Why does the temperature of the air change?
3. How does the oil rise in a lamp wick?
4. What causes frost?
5. What is the effect of freezing on different liquids?

A student might find the solution or answer to any one of these problems in a textbook. By deductive thinking he might arrive at a solution without undertaking an investigation, but it would not be the most effective way of learning the facts. In the formal school, the student would look in his textbook to find a cut-and-dried answer to his problems. He would make little or no effort to search for all the information he could possibly obtain before formulating his answer or conclusion. He would fail to go through the process of discovering the answer to his problem by actual experimental trial.

The experimental process may be contrasted broadly with the deductive process of learning as illustrated by geometry and formal grammar. Illustrations of problem situations from these subjects are given below for study.

1. Parsing nouns, pronouns, verbs, and other parts of speech.
2. Diagramming sentences.
3. Learning the rules of syntax.
4. Learning axioms.
5. Demonstrating theorems.

In such activities the temptation is to memorize words or, at best, to repeat the type of thinking which was used in arriving at principles or mastering processes. This is a valuable type of experience, but it cannot take the place of true experimentation. It lacks challenge and it fails to stimulate activity. Experimental learning leads to true discovery and teaches the use of the experimental method, which is one of the three or four principal methods of discovering new truths.

Interest and How It Functions. Finding out things for oneself is an interesting activity. It becomes more interesting as progress and success are made obvious to the learner from time to time. Usually it is within the teacher's power to create opportunities for discovery on the part of pupils. If successful investigations are made possible,

there need be little doubt but that progress and happiness will characterize schoolwork. Experimental learning requires no extrinsic motivation. It is worth while in itself and furnishes its own challenge. It makes unnecessary much meaningless repetition and gives meaning to laws and principles formerly difficult to learn. Experimental learning is its own best motivator because it is natural, purposeful, and active. Extrinsic motivation is neither necessary nor desirable.

Directing Experimental Learning. The very nature of the experimental method of learning often makes it necessary to omit the assignment in out-of-class study until pupils have learned something of the technique of experimentation. Careful guidance is necessary during the initial stages. The teacher must direct the process through questioning, comment, and explanation. It may happen, however, that, in the case of some of the less difficult processes, such as the egg experiment, pupils may be given the opportunity to carry on the experiment at home or in the laboratory. The assignment in this particular instance would be to study the directions given in the textbook. These directions would give an adequate basis for independent procedure by the child. But this practice should not be extended to a point where pupils will have to depend entirely on textbook explanations in order to carry out an experiment. There will always be a few pupils in class who readily "catch on," but the great mass of them will have to be questioned on this and that step in the process or operation before they can see through it. The safest plan to follow is to develop with the pupils the technique involved in the process and make certain that they understand it. The assignment following this method of learning is typically a drill or a practice exercise. The pupils may apply the principle learned to other situations, or study the results of the records made and seek to clarify any points which may have escaped them previously.

The interest of boys, particularly, in home experimentation suggests that the teacher should take an interest in practical mechanics and simple chemistry and cooperate with boys to extend their experimental learning in homes, shops, and laboratories. Such magazines as *Popular Mechanics*, *Popular Science*, and others furnish much interesting material for outside assignments that may greatly increase the child's appreciation of the experimental method and furnish him an excellent hobby for his leisure hours. Care

should be taken, however, to give young children sufficient class instruction and demonstration so that they will learn not to try dangerous experiments and to consult their teacher when in doubt. Many a future chemist or physicist may find his life interest in these simple boyhood experiences.

Recitation Activities. In experimental learning, as in many other methods of learning, the activities which are suitable for the recitation proper may also be suitable for the assignment, and vice versa. The conditions of learning largely determine whether one type of activity or another can be most advantageously employed as the assignment or as the recitation. Pupils may make observations, prepare materials, attempt solutions of the problem, and verify them as a part of the assignment, or they may engage in these activities in the recitation proper.

In the laboratory work, lecture and demonstration precede actual experimentation. Whatever may be the course of action, there are certain principles to be adhered to in conducting the recitation in experimental learning. They are:

1. *Demonstrations.* How to do a thing or carry on an activity calls for a demonstration by the teacher to make the performance clear to the learner. A simple experimental technique should be demonstrated, showing the various steps involved.
2. *Discussions.* A discussion of problems, techniques, and materials with pupils for purposes of directing their thinking is essential. This practice permits the class to ask questions concerning their difficulties, to answer questions, and to organize their thinking. They get "clues" and "leads" to additional data, and learn to determine what is important and what is not important, as well as to obtain many suggestions on habits of work.
3. *Evaluation.* The recitation should help pupils to analyze, evaluate, and organize materials; to reject anything which does not bear directly on the solutions of problems, and to include all materials which further satisfactory solutions. This practice calls for a detailed analysis of all materials. It is a sifting process and teaches pupils to react critically to the data gathered.
4. *Conclusion.* This is the culmination of all reflective thinking or reasoning—the arrival at a satisfactory conclusion. It is not, however, the final step in the recitation, but it is the last step of the first draft of the experimental study. It is the result of gathering data, analyzing, sifting, and organizing materials in such a manner that a correct solution evolves.
5. *Verification.* When a conclusion is adopted by the class as the one most likely to be correct, it must be proved. This may be done in several ways, either by applying it to a new and similar situation or

by further experimenting with it. Often a check on the inference can be satisfactorily made by consulting books, people, or authorities.

6. *Application.* This is the final step in all learning. It is the acid test of mastery of an activity or process. How well the learner can use what he has learned is an excellent measure of his practical learning ability.

In the process of getting pupils to discover things for themselves, the question is often asked how much of any experiment should be developed in class with the group. It is impossible to lay down any set rule. This depends to a great extent on the ability of the group to grasp the technique and the principle, and on the nature of the problem or process being investigated. The explanation of an experiment should continue until each individual member of the class fully understands what is to be done. This condition, as was stated above, varies with the ability of the class, as well as with the nature of the experiment.

Measurement. Proof of the success in teaching experimental learning can be quite adequately determined by observing the behavior of children while carrying on the process. Oral and written tests are valuable for purposes of obtaining a detailed check on the knowledge gained through the process. Tests of application of the principles learned are especially appropriate and should be frequently used. Also a student's check list, such as the following, will be found very helpful in aiding pupils to master the technique of discovering facts, principles, and processes through experimentation.

A STUDENT'S CHECK LIST FOR EVALUATING SUCCESS IN EXPERIMENTAL LEARNING

Directions. Encircle "YES" if you adhered to or observed any of the following conditions in discovering a problem, principle, or process; encircle "NO" if you did not.

- | | |
|---|--------|
| 1. Did you find your own problem for investigation? | YES NO |
| 2. Did the problem for study originate from class discussions? | YES NO |
| 3. Was it particularly interesting to you? | YES NO |
| 4. Were you anxious to investigate it? | YES NO |
| 5. Did you think that the problem for investigation would develop a fundamental principle or process? | YES NO |
| 6. Did you have a plan of investigating the problem? | YES NO |
| 7. Did you obtain help from class discussions in formulating a plan of investigation? | YES NO |

8. Did you perform your own experiment?	YES	NO
9. Did you consult other experiments of a similar nature?	YES	NO
10. Did you carry on further experiments to obtain additional data?	YES	NO
11. Did you report your data to the class?	YES	NO
12. Did you obtain valuable suggestions from the class for further experimenting?	YES	NO
13. Did you exercise care in carrying on your experiment?	YES	NO
14. Did you make any mistakes?	YES	NO
15. Were you able to find and correct them?	YES	NO
16. Did you arrive at your own conclusion independently?	YES	NO
17. Did you have someone to help you decide on the correct conclusion?	YES	NO
18. Did you verify your conclusion by other experiments?	YES	NO
19. Did you apply it to see if it were useful?	YES	NO
20. Did you remain unprejudiced throughout the experiment?	YES	NO
21. Did you follow throughout in detail the experimental method?	YES	NO

Outcomes. The chief outcome of experimental learning is the discovery of a principle, process, operation, or technique. This means that pupils must know not only how processes, principles, and techniques are derived, but how to apply them when they are discovered. There are also certain techniques peculiar to experimental learning which the pupils should acquire: ability to locate and define problems, ingenuity in making hypotheses and inventing ways of trying out possibilities, and skill in analysis, evaluation, and conclusion. In addition, the pupil should develop tentativeness of mind and absorb something of the scientific spirit. He should come to understand how truth is derived and should develop a favorable attitude toward experimentation and the results of experimental methods.

STUDY QUESTIONS

1. Why should elementary school pupils be given practice in research of a type in keeping with their abilities and experiences?
2. What is the relation of the inductive and deductive processes to experimental learning?
3. Why is it necessary to have a working knowledge of the technique involved in experimentation?
4. What are some principles, processes, and techniques which may be effectively developed experimentally?
5. What phases of the tool subjects of the elementary school are usually developed by the inductive process? The deductive process? Are there any experimental problems in these subjects?

6. What are some problems or phases of the content subjects which may be developed experimentally?
7. Suggest an assignment which pupils may successfully do out of class in experimental learning.
8. What factors are involved in the technique of getting pupils effectively to discover things for themselves?
9. Why should principles, processes, operations, and techniques be developed experimentally?
10. What are several practices which have been formerly used but should be avoided in developing principles, processes, and techniques?
11. What is the final proof of the mastery of the experimental method?
12. What is the value of a student's check list in evaluating progress in experimental methods?
13. Why should pupils be taught to review their experiences from time to time in carrying on an experiment?
14. Why should verbal generalizations be related to specific experiences in teaching?
15. What training should be given in the making of experimental records and in the use of experimental apparatus?

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Chapter VIII CREATIVE LEARNING

Creative learning constitutes an essential phase of every worthwhile classroom activity, although the teacher and pupils may not always be aware of it. Its technique is so little understood that most teachers never consciously apply it or seek to develop it. All learning which involves in any sense the creation of a new idea, process, or thing is creative. Creative learning employs inventiveness and imagination; it is purposeful and constructive. Greater emphasis upon creative learning would lead to the development of originality of thought and to greater enjoyment on the part of the learner, for creative activity is a necessary aspect of a happy life.

The Essential Aspect of Creative Learning. While the creative element may occur incidentally in many types of situations, in this discussion it will be dealt with as an aspect of serious, purposeful thinking and doing. In education creative learning has gone on chiefly in language, composition, industrial arts, music, art, and to a lesser extent in other activities. Wherever teachers and children use creative imagination, creative learning and thinking are being promoted. The essential thing about it is that the learner, through exercise of his imagination and reasoning ability, is learning to put things together in a new way. He may create a new idea, a new process, or a new product. He may invent what is to him a new way of thinking, or he may, through his own efforts, simply re-create what has already been created.

It is not necessary, then, that the creative thinker shall be a creator in the sense that nobody has done the same thing before. The child is creative when he makes the model of a dog out of a

piece of clay, if in the process he is not simply copying someone else's dog. He is creative when he makes an original poem, when he invents a phrase, when he makes a doll's house out of a paste-board carton. Creativeness lies in his doing the thing himself, prompted by his own imagination and his own inventiveness.

Analysis of Creative Work Difficult. The factors involved in creative learning are not easily described for the reason that the steps in the creative process are difficult to analyze and record. They vary tremendously among individuals. Literature, art, and music abound in examples of the work of creative thinkers, but the technique which the artist employs to produce the poem, the picture, the painting, or the song cannot be known except in an indirect way through a study of the product or through the description of the process by the artist in retrospect. John Livingston Lowes¹ writes of Coleridge:

Coleridge's notebook is a catch-all for suggestions jotted down chaotically from Coleridge's absorbing adventures among books. It is a repository of waifs and strays of verse, some destined to find a lodgment later in the poems, others yet lying abandoned where they fell, like drifted leaves. It is a mirror of the fitful and kaleidoscopic moods, and a record of the germinal ideas of one of the most gifted and utterly incalculable spirits ever let loose upon the planet. And it is like nothing else in the world so much as a jungle, illuminated eerily with patches of phosphorescent light, and peopled with uncanny life and strange exotic flowers. But it is teeming and fecund soil, and out of it later rose, like exhalations, gleaming and aerial shapes.

The poet gathers his preparatory material from endless sources. His whole life is a preparation for his work, and all his experiences are raw material for creative achievement. Likewise the child's experiences in school should be a preparatory period of gathering information from all possible sources for later maturing, as well as a period of experimenting with these materials in creative ways. Without a wealth of raw material there would be little for the creative mind to work on. The imagination must have an abundance of material out of which to mold new products. The old must be transformed into the new. This, as one writer² puts it, "occurs either as a reconstruction, an integration, an intuition, an abstrac-

¹ Lowes, John Livingston, *The Road to Xanadu*. New York: Houghton Mifflin Co., 1929. P. 6.

² Schoen, Max, *Art and Beauty*. New York: Macmillan Co., 1932. Pp. 35-73.

tion, a generalization, or a transmutation." Experiences must be reconstructed, reorganized, reevaluated, transformed, and integrated into entities possessing new characteristics in order that new products may be created.

Another writer ³ discussing originality in art says:

In thinking in the fields of literary, musical, and other artistic productions, familiarity with the products and techniques of the masters seems to be quite as useful as acquaintance with the facts is essential to originality in other fields. In the æsthetic fields the fear that familiarity with other products may cramp or inhibit originality seems to be more frequently and tenaciously held than in business, mechanics, or science, but for no good reason. In the better types of instruction in composition, drawing, design, and the like, more attention is given than formerly to study of good products, to theory and technique. Originality is fed by such equipment; starved by poverty of examples and precedents.

This is a point of view which should be widely accepted by teachers of every school subject without any fear that the child will become a mere imitator of others.

Two Major Types of Creative Activities. Creative activities are of two distinct types: (1) those which develop with children more or less spontaneously without directed training; and (2) those which in the beginning stages of learning are directed, but gradually develop into original and spontaneous activities. The former type includes playing, acting, impersonating, dancing, singing, and many other similar activities which are often incidentally learned in the child's home and school environs, while the latter type includes, besides these and numerous other activities, those involved in writing a poem or a composition, preparing an oral or a written report, designing a pattern, painting a picture, and the like. Both types of activities may be creative for the learner, depending on whether he has or has not had similar previous experiences.

Any new experience may be considered creative for the individual, regardless of its commonness in the world. Too often this fact is overlooked by teachers with the result that the creative mind of the child fails to respond in all its fullness. The proper stimulation and guidance are essential requisites of creative endeavor. Suitable activities should be furnished to arouse the creative power which is probably inherent in every child, and these should consti-

³ Gates, A. I., et. al., *Educational Psychology*. New York: Macmillan Co., 1942. P. 495.

tute a liberal program of work, free and unhampered by the teacher and other agencies. Opportunities for creative learning should provide generously for children to project themselves forward independently in their daily work without too much limitation from the school and teacher.

Creative Activity Its Own Reward. Creative activity is commonly employed for purposes of producing either a new product, a new type of organization of materials, or a new way of thinking. In such instances the learner usually has some definite objective which is satisfying in itself. At other times he creates for the pure joy of creating. He writes, draws, paints, and composes solely for the enjoyment that he can obtain from the practice. Creative activity is not, however, generally characteristic of most schoolwork, but it is often engaged in by children when they are not employed at the regular routine of the school. The practice of engaging in creative activity should be encouraged under such conditions that some educational value will result from it.

When Work Is Creative. Generally speaking, whether or not schoolwork is creative depends largely on the type of activity undertaken by the class. If the class is composing a play to be dramatized, preparing an oral or written report, composing a poem, or making a design, the work will be largely creative, and children will purpose, plan, and evaluate in order to produce the best possible results. Likewise play, with all its spontaneous original action, is creative. Learning is creative when the child is expressing himself in various ways. This is active learning. The contrasting type is the imposed memorization lesson of the traditional school where children had no responsibility and exercised no initiative.

Creative learning is engaged in for its own sake. If, in the process of learning, children discover the need for better tools and equipment, well and good. However, this type of learning should not be regarded by the teacher merely as a means to success in the development of skills of various kinds, but rather as a type of experience essential to true learning or change in the conduct of the individual; creative learning is creative expression, and creative expression is an essential to healthy and happy living. In brief, when a child undertakes an activity—plans, organizes, and completes it—he is doing what is creative work for him, regardless of whether it is a purposeful activity of the work or one of pure relaxation and enjoyment.

Fields for Creative Work. Creative work may be successfully undertaken in any school subject where problems and projects may be found or where operations, processes, and techniques are used. Writing a poem, painting a picture, sketching a cartoon, preparing a report, designing a pattern, understanding a process or operation, learning the use of a language, applying a technique, and, in fact, learning new things of all sorts and applying them in new ways, constitute a group of activities which involve considerable creative endeavor on the part of children. Wherever children are allowed to purpose and plan, a certain amount of creativeness will always be involved. Every school subject offers possibilities for doing something new to the alert child. Literature, art, and science are particularly rich in materials for creative work. Materials of geography and history can be reorganized in the form of projects and problems to challenge children's creative powers. Any subject which requires the learner to organize his thinking develops creative ability.

Inherent Interest Motivates Activity. Creative activity is usually the most inherently interesting type of educational experience. The very nature of it seemingly appeals to children's inborn urges. The desire to construct and devise finds gratification in creative work. The boy who builds a viking ship relives the experiences of the pirates of the Northland. And in reliving these experiences, he is stimulated in a large measure to greater effort. Give him a paper and pencil with a few suggestions as to what might be done with them, and he will draw pictures, sketch cartoons, make designs, figure, scribble, and the like with a great deal of satisfaction and ease. To achieve something new is satisfying and a powerful stimulus to forge ahead. Activity is interesting and worthwhile for its own sake. The most effective motivation invariably results from those activities which are inherently appealing to children. Thus it is important that the teacher recognize this fact from the very beginning of creative work.^{4, 5}

Independent Work Directed. In creative activity, the assignment is obviously a proposal to create something of a purposeful character. The teacher or the pupil may make the proposal. The student undertakes to engage in the activity. The teacher helps him to plan

⁴ Mearns, Hughes, *Creative Youth*. Garden City, N. Y.: Doubleday, Doran & Co., 1929.

⁵ Zye, Claire, *Willingly to School*. New York: Scott Foresman & Co., 1934.

and organize the activity and get it under way. In the process, he may direct the pupil to materials or suggest the necessity of some kind of preparation for the activity. In this sense he may be said to make an assignment.

The nature of the assignment, however, differs greatly from that in more coercive teaching. Children undertake tasks voluntarily. They have a much larger share in planning and organizing activities than in older types of teaching. The assignment as a job or task often interferes with rather than encourages creative work. It approaches the routine and is not conducive to originality.

Well-planned suggestions about interesting activities will often stimulate children to begin a piece of original work. It is not unusual to find them displaying originality at the sight of pictures, designs, patterns, cartoons, and mechanical devices. Demonstrations and illustrations, accompanied by interesting descriptions and explanations, are invaluable in initiating creative activity.

The assignment in this type of work is best made when it gives an opportunity for pupils to exercise their originality in dealing with life in its various aspects.

Class Activities. The recitation activities of creative teaching consist largely of purposing, planning, discussing, demonstrating, and organizing materials in preparation for new experiences; in writing, composing, acting, performing, or in some other similar activity; or in exhibiting, evaluating, and discussing the product of creative effort. In any case the recitation is a cooperative group enterprise. Much opportunity for free discussion is essential. At times, the recitation is a work period in which children are actually writing, drawing, sketching, painting, designing, or constructively making something under the sympathetic guidance of the teacher. At other times, it is a cooperative conference for mutual criticism and suggestions of a helpful character. In no case is the recitation merely a period of reciting what has already been learned. It is a time for stimulating and initiating activities through talks, demonstrations, illustrations, readings, and action. When pupil-activity is in progress, the teacher's work will be to guide, suggest, encourage, and render whatever assistance he deems essential to continued progress. He leads by his skill in understanding his pupils and by suggestions rather than by commands. The recitation period thus becomes a time of rich interchange of ideas, of sympathetic appreciation, and of group planning for future activi-

ties.⁶ The old idea of the recitation is supplanted by a new procedure requiring purposing and planning, evaluating and discussing—voluntary activity—instead of prying, questioning, and examining in an effort to get children to repeat the words of the textbook.

Four Stages in the Creative Process. One writer⁷ recognizes four stages in the creative process. They are the stages of preparation, of incubation, of illumination or inspiration, and of verification.

In the stage of preparation, the student gathers his materials from wide reading and extensive exploration. He searches for information from every possible source. Sometimes this seeking for something is deliberate as in scientific work, but more often it is accidental and incidental without any conscious purpose. It is a period of gathering the raw material for future use in an auspicious moment.

In the stage of incubation, the student unconsciously elaborates what he has gathered in the previous period. His attention is usually on something other than the ultimate outcome of his mental activity. He enjoys a period of idleness and fruitlessness after browsing around in the various sources for raw materials.

In the stage of inspiration, the student is more or less aware of the solution of the problem or situation, although what it is to be is not yet known. He begins to feel that the results of his efforts are near completion. What has been largely unconscious is now revealing itself in the form of something new and unexpected. A new idea begins to appear above the horizon. It is maturing into something very definite.

In the stage of verification, the student subjects his new idea to a rigid systematic reasoning process. He makes a conscious attempt to prove or disprove the value of its existence. He culminates his creative endeavors by reasoning and deliberating on the product attained through his imaginative efforts.

The above formula is not a rigid one to be followed in creative work. It is merely suggestive and will be found helpful to the alert teacher who is attempting to guide creative activities.

Evaluation of Results. The accomplishment of a finished product constitutes the test of ability to create. In writing and composing,

⁶ Schoen, Max, *Human Nature in the Making*. New York: D. Van Nostrand Co., 1945. Pp. 143-62.

⁷ Schoen, Max, *Art and Beauty*. New York: Macmillan Co., 1932. Pp. 38-53.

the end result of pupils' efforts may be a poem; in manual arts, a design; or in some other fields, a product possessing something of an original character. The quality of the finished product varies greatly with different pupils, and is measurable, to a large extent, in a comparative way. That is, each pupil's composition may be compared with those of others or with some established norm. If the resultant product of the pupil's efforts has been some concrete object, a more exact measurement may be made. For example, if the pupil has made a piece of furniture, the rule or square may be used to check on the accuracy of the labor, or a score card may be devised and used to measure the general quality of the product. Usually, finished articles in those fields where concrete things can be made are subject to more objective measurements than the products in the more abstract fields of work. Teacher-made tests of a factual nature may be devised to supplement other types of tests as it becomes necessary and practicable from time to time. These tests may be made up as an outline, a design, a diagram, or in some other appropriate form for elaboration by the pupil. The score card below is suggestive of a helpful measuring device which may be satisfactorily employed by the pupil in checking on original productions.

Outcomes. The most significant outcome of creative endeavor is not to be found alone in the finished product of the endeavor, but rather in the many abilities acquired in producing the product and in the satisfaction derived from the activity. In other words, children develop expert skill through successful practice in creating something. They learn to plan, to compose, to initiate, to undertake, to organize, in fact to develop all those important abilities involved in creative production. Creative activities are not only interesting ways of reaching desired objectives, but they are also worthwhile for themselves alone. The pure enjoyment which children obtain from creating something, even though it be a picture of their teacher, is often a great stimulus to other activities of a similar character.

A Student's Score Card for Measuring the Value of a Product.

Directions. Assign ten points to each characteristic of the product, which represents skill and originality; assign zero to any characteristic which reveals nothing original; and assign points ranging between these two extremes to those characteristics which possess little to much originality.

CHARACTERISTICS OF ORIGINAL PRODUCTION	SCORE PERFECT	SCORE STUDENT'S
1. Appearance or general effect: original and pleasing	10	
2. Design or model: original, practical, effective, and artistic	10	
3. Workmanship or skill in production: skilled, with original touches; unskilled with original features	10	
4. Elaborateness of production: much original thinking as well as extensive searching for raw materials indicated	10	
5. Usefulness of production: can be used for practical purposes; nothing like it has been created; it fulfils a need	10	
	<hr/>	
Total score	50	

STUDY QUESTIONS

1. In what sense is all learning creative?
2. What are several activities in which children may engage without direction?
3. To what extent may creative activity be employed as an end in itself?
4. What is the significance of wide experience in creative work?
5. What is the value of a notebook, such as Coleridge kept, in creative work?
6. What are several specific activities in which children may be engaged in producing a story? A design? A cartoon?
7. When is a thing creative for a child?
8. What is the criterion of creativeness for school children?
9. What may be the effect of demonstrating to school children how a pattern is made or how a cartoon is sketched?
10. In what sense are assignments not made in creative activity?
11. Why is sympathetic cooperation so necessary in creative work?
12. What are some valuable suggestions for encouraging children to purpose and to plan?
13. How may creative endeavor be most successfully measured?
14. What are several abilities developed through creative endeavor?

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Chapter IX APPRECIATION

Appreciation is a form of activity so different from other types of learning that it is necessary to find a process or technique other than that usually employed in teaching to develop its various aspects. It is widely agreed that appreciation can be learned. The fact that conventional classroom practices are too formal and analytical to foster it, is not always obvious to teachers. There is probably no other type of school activity that has been so misunderstood, misapplied, and subjected to so much formalism as activity in which appreciation is the chief and ultimate aim of teaching. This is unfortunate. The situation presents a challenge not only to the teacher of art, music, and literature, but also to the teacher of science, history, and mathematics. Naturally these questions arise: What can be done about improving this condition? Can appreciation be taught? Why do teachers of art, music, and literature have so much difficulty in getting children to appreciate their subjects? Can children learn to appreciate science, history, mathematics? These and a number of selected questions will be discussed in this chapter.

The Meaning of Appreciation. That appreciation cannot be taught in the same sense in which facts and skills can be taught is more or less apparent to thoughtful teachers, and that a foundation can be furnished upon which appreciation may be developed is generally believed. The possession of a wide vocabulary or an extensive knowledge of the technique of writing carries no assurance of an appreciation of composition and rhetoric; but an understanding of

the technique of and skill in writing may be helpful in gaining an appreciation of the subject. To this extent, appreciation of composition can be taught. Yet one may appreciate the use of a mathematical formula, such as that for finding the cube root of numbers, without knowing or understanding how it is derived. However, a knowledge and understanding of its application to a variety of situations in attaining a desired product or goal may, after all, be the real cause for the appreciation of the mathematical formula.

Few will deny that knowledge and understanding are relevant factors in developing appreciation. Mere familiarity with the facts involved in developing techniques and formulas may add little, if anything, to one's appreciation of mathematics. Neither may the mere acquaintance with the facts of history or their memorization further one's appreciation for that subject. Facts and information must be integrated into a meaningful whole and applied successfully before the learner can begin to appreciate or feel that they are really significant.

It is this feeling of the learner that constitutes the distinction between simple comprehension and appreciation. When one realizes that the facts, information, and techniques with which he is concerned are useful in attaining a desired end or goal, he begins to appreciate their significance and value in solving problems, in formulating projects, and in studying subject matter of textbooks in general. He appreciates what he understands and can use to advantage in reaching desired goals or creating desired products.

Two Aspects of Appreciation. It seems to the authors that the chief aspects of appreciation are the aesthetic and the intellectual. The aesthetic aspect of appreciation deals with the beauty in experience. It is an appreciation of the pure form of what is observed, what a thing is in itself, without attributing meanings, values, and uses to it. For, to quote from Schoen:¹

When the mind begins to describe, to explain, to evaluate, to relate, to interpret and judge, attributes are created which originate from the object but are not of the object. But during the moment of beauty the object is stripped and cleansed of all its impositions and vestments ordinarily imposed upon it; it is present to the mind in all its naked purity, shorn of all adornments with which more ordinary experiences are burdened and disguised.

¹ Schoen, Max, *Art and Beauty*. New York: Macmillan Co., 1932.

An experience is no longer one of beauty alone when analytical judgment is exercised, although the emotional tone produced by beauty still affects the experience. When analysis begins, appreciation becomes an intellectual activity of one's own making and belongs to another aspect of appreciation, the intellectual. Then, study and problem solving will be the chief concern of the learner. The whole process of appreciation here differs to a marked extent from the aesthetic aspect. The learner meets a perplexing situation; defines and limits it; searches for clues to the solution or formulates hypotheses; works out the implications of the several hypotheses; and finally tests the hypotheses by comparison with objective facts. This is sometimes referred to as the reflective process. It is chiefly intellectual, although it may be tinged with emotion.

Appreciation, therefore, is both emotional and intellectual. It is gained through experience and is often caught rather than taught. The important thing to be noted is that it is an outgrowth of experience with the thing itself. A wealth of aesthetic or intellectual experience is the necessary matrix of true appreciation.

Appreciation an Outlet for Emotion. Aesthetic appreciation is commonly applied to those activities or products of activities that are engaged in as ends in themselves, in contrast with activities or their results having an aim beyond themselves, which may be useful but not beautiful. It is probable, however, that the appeal which this type of appreciation makes to the emotional side of pupils' lives may be an important motivator of their schoolwork. In this sense, aesthetic appreciation might be considered instrumental in getting the desired emotional set for subsequent study of a more intellectual nature. But this is not the chief function of appreciation. It is a subsidiary aim only. The real purpose is to give pupils an outlet for their emotional experiences.

Teachers of English aim to develop in pupils not only an appreciation of the content of literature, but also an enjoyment of beauty, style, form, and rhythm. The teacher of reading strives to emphasize the ability to comprehend the printed page plus the ability to appreciate the style and diction of the writer. Likewise, teachers of art and music aim to develop an appreciation of the beautiful as well as an understanding of technique.

The Intellectual Aspect. The intellectual aspect of appreciation is common, however. It may be developed in geography, history, science, and in other abstract school subjects. It is not without its

emotional aspects, but it is primarily concerned with understanding. The student may appreciate the significance of an invention, a historical character, or a movement in history only when he thoroughly understands it; he may appreciate phases of these and other activities without a comprehensive grasp of the conditions causing them, although the latter is doubtful. This type of appreciation may be accompanied by an emotional glow involving a feeling of pleasantness or unpleasantness, but it is a purposeful thing as compared with the more sensorial and incidental pleasure derived from aesthetic experiences. It is, therefore, important that the teacher provide opportunities in all school subjects for aesthetic as well as intellectual experiences.

Appreciation in the Curriculum. It is not an exaggeration to say that appreciation may be involved in all the subjects of the school curriculum. Even mathematics may be taught for appreciation purposes. To some it appeals as an enjoyable activity without practical use. To others the practical use of mathematics adds to appreciation. Who has not had occasion in his later years to apply a simple geometrical formula, learned in school, in marking off a tennis court, a baseball diamond, or a basketball court, or to measure a square or rectangular area in the yard or garden? To be able to employ mathematical techniques to do something of this sort without having to inconvenience oneself by asking someone else's help increases the appreciation of the user for practical mathematical knowledge and adds very greatly to one's enjoyment. He sees the significance and value of mathematics. That knowledge increases his intellectual appreciation and at the same time favorably affects his feeling toward the subject.

Literature offers the greatest possibilities for the development of aesthetic appreciation among school children. Next to literature, in order, may be mentioned art, music, science, geography, and history. But literature, art, and music are the subjects in which this type of experience predominates. Intellectual appreciation will be most effectively developed in the subjects of science, geography, history, mathematics, and in the other abstract school subjects. In fact, wherever problem situations may be found, the intellectual aspect of appreciation will be involved. It is possible, however, that both aspects of appreciation may be successfully developed in any one subject or group of subjects, depending on what the teacher is emphasizing.

Interest and Appreciation. Interest in any type of classroom exercise or in any subject regardless of its nature depends, to no small degree, on properly setting the stage to obtain the desired responses from the student. Skillful teaching is marked by getting pupils in the right sort of emotional set to forge ahead in the study of a unit of work. This condition may sometimes be successfully accomplished by relating incidents connected with the scene or character of a literary production, thus giving the pupils those experiences which constitute a portion or all of the background of the subject under consideration. Pupils may learn to appreciate the masterpieces of art and literature only to the extent that they understand the conditions under which these were produced. Likewise, in other fields of study, pupils learn to appreciate and to become interested in the master productions of these fields when they understand the conditions under which the great minds of the world functioned.

The First Impression. According to one writer² the first impression of a poem, a song, a picture, or a building is a privileged impression in the sense that it is more spontaneous and more intense, as a rule, than any subsequent impression. This does not necessarily mean that the first impression is the most lasting one in every instance, but rather it means that the first impression largely determines our likes and dislikes, our predispositions and prejudices toward the object, person, or thing. Yet it is a fact that when an impression is attended by an emotional glow, it lingers with us indefinitely.

Anticipation and Interest. Anticipatory interest or excitement is an important factor in motivating the appreciation activity. If, for instance, a new poem is to be taken up with the class or a new story is to be dramatized, the teacher should take measures to arouse the expectation of the pupils long before he initiates these activities. He may render brief personal anecdotes, create inspiring news items, devise with the class posters for display, or he may manipulate other lessons in the interest of appreciative expression. That is, he may take a character or an episode from history and tell the class that on such and such a date they shall learn some interesting things about a great man or a crucial event in American history. It is much worthwhile to employ this element of anticipation in teaching, providing the technique is changed from time to

² Hayward, Frank Herbert, *The Lesson in Appreciation*. New York: Macmillan Co., 1915. Pp. 2-4.

time in arousing the expectation. The practice of motivating schoolwork through natural or artificial means, as well as other similar practices may, however, become very monotonous to children through abuse.

The Desire to Know and Intellectual Appreciation. Interest in intellectual appreciation probably arises from the desire to know or to be familiar with the things which we believe to be useful and practical. The problem attitude is often helpful in arousing a desire to appreciate such a development as the Einstein theory. Among children a desire to understand how a gasoline engine works may be aroused by discussion and by asking questions about it. In a like manner, other problems may be attacked and solved. The by-products of such study are primarily intellectual in nature, but they are often accompanied by an emotional glow.

Out-of-Class Work. In aesthetic appreciation, the out-of-class assignment—if made at all—should function to create greater enjoyment in the project or activity of the recitation. References need not necessarily be definite and detailed, as this practice in making assignments detracts from the pleasure of the activity.

Any kind of assignment which adds to anticipatory interest should be encouraged. This may consist of writing a news item, making a poster, reading anecdotes and cartoons, and the like. The teacher may suggest questions about the beauties of literature, art, and science, and permit children to find them out for themselves; or he may stimulate search for the exquisite and beautiful aspects of life as described in literature and science.

It too often happens that children's interests in appreciative activities are inhibited by the use of assignments on the work level. Enjoyment is, therefore, reduced to a minimum. Assignments are tasks rather than inspirational activities. An effective assignment in literature may be made by indicating extensive readings for purposes of getting those experiences necessary for a more complete understanding and appreciation of an author and his works. It will thus serve as a means of inspiring children toward the desired emotional set for appreciating the subject or activity. Guidance will be necessary, but it will be of a different sort from that given pupils in the intellectual type of appreciation. Here the assignment can be more detailed and provide more guidance, as in a study-guide sheet for the study and preparation of data concerning an historical epoch, a scientific invention, or a geographical area. These and

other similar problems will require assignments on the work level.

The Discussion Period. The recitation or discussion period in lessons of the appreciation type may be taken up with a variety of activities—assignments, discussion, listening and observing, or performing for the benefit of others. In the aesthetic appreciation period, the recitation often becomes a period of participation in art, music, or literature. The teacher reads or recites, the pupils take part in singing, dancing, or other aesthetic experiences. This type of experience is more relaxed and experiential than the intellectual type of appreciation as it is developed in the study of literary, social or political history, or geography. There is not here the serious study attitude often found in other types of activity.

To make aesthetic experiences hard work for their own sake, or to formalize these experiences and drill the children on meaningless facts, is to kill joy in them. Teachers often make the mistake either of talking the subject to death or of treating an aesthetic experience as if, like important factual information of a practical character, it were a suitable subject for drill, examination, and grading. Beauty speaks for itself. Pleasure is justified for its own sake. It is a very clever teacher who can introduce a poem in such an effective fashion as to add to the effect produced by the poet.

Of course, information is often essential and must be given as a prelude to or immediately following the aesthetic experience. Discussion and evaluation are also desirable. The teacher should attempt to get genuine expressions of appreciation from children. Often, however, there is little need for anything except the most delightful kind of participation in an enjoyable experience.

When the object of the recitation is to develop an appreciation of the intellectual type, more explanation, questioning, comment, and discussion may be essential. Appreciation should come as a by-product of serious problem-solving or other intellectual activity. The study of the life of a great historical character, of a chemical process, or of a technique in drawing, singing, or other arts may involve the most serious kind of intellectual effort. Appreciation comes with understanding. Often recitations of the appreciation type will involve hard intellectual work and may be problem-like in character.

Sometimes appreciation is best gained by experiencing or doing. Listening to a concert or a speech, viewing an exhibit of paintings, playing an instrument in an orchestra, or taking part in a chorus

may be the surest means of developing an appreciation for the beautiful.

The recitation may be concerned with all these things.

Suggestions for Teaching Appreciation. Hayward³ gives a number of valuable suggestions for the teaching of appreciation. Several of these are summarized below:

1. Create an opportunity for a privileged impression; that is, have the first impression an intense one.
2. Create an anticipatory interest in the poem or painting—work up excitement.
3. Bar all distractions—such as poor physical conditions, hard words, bad techniques, etc.
4. Group ideas together; that is, reinforce crude admirations by means of such intellectual elements as interpretation, memories, contrasts, etc.
5. Employ familiarity to enhance the pleasurable nature of musical passages.
6. Have pupils repeat beautiful verses and selections. Rime is important, so also is rhythm.
7. Have pupils learn some things by heart. This practice can be overdone, but it is much safer to know a few things by heart than not to know them at all.
8. Provide opportunity for intellectual discussion or the exposition of meaning. While this practice does not ordinarily fall under the category of aesthetic appreciation, nevertheless it is important in getting a better understanding of the passage.

Appraisal of Appreciation Difficult.⁴ It is difficult to measure the degree to which one gets an appreciation of anything, although it is more or less obvious that some pupils have greater sense of appreciation for things than others. This fact is observable in children at play. The standards must be, by their very nature, comparative ones and largely matters of personal opinion. Oftentimes children best show their appreciation toward things and activities while engaged in playing their favorite games, in singing songs, in reciting poetry, and in other kinds of activities. Their likes and dislikes are more or less apparent to the careful observer. But it is very difficult as yet to measure these qualities with any degree of objectivity, and it is doubtful whether it is necessary to measure appreciation when the chief purpose of the activity is either the pure enjoyment of the beautiful things of life or an intellectual experience for its own sake.

³ Hayward, F. H., *op. cit.*, pp. 9-98.

⁴ See the *Carroll Prose Appreciation Test*. Minneapolis: Educational Test Bureau, 1932. See also "Tests for Measuring Appreciation," *School Review*, Vol. 23, 1925, pp. 491-92.

Outcomes. Participation in the activities of aesthetic appreciation furnishes children with those experiences which are essential in developing a love for beauty, style, form, and rhythm in art, music, and literature. These activities also may furnish experiences which result in likes, dislikes, tastes, resentments, prejudices, and other feelings and emotions. All these experiences are involved in developing high standards of conduct and right living. Aesthetic experiences either lift us above the commonplace things of life or let us drop below this level.

The more purely intellectual appreciative experiences find an outlet in the study of problems in which ability to comprehend and understand is involved to the fullest extent. The outcome of intellectual appreciation is deeper understanding of the values and significance of persons, objects, and events. Intellectual appreciation does not necessarily affect the conduct of the individual or lead to action.

STUDY QUESTIONS

1. Why is conventional classroom practice usually ineffective in developing appreciation?
2. What are the chief characteristics of aesthetic appreciation? Intellectual appreciation? What is an example of each aspect of appreciation?
3. Why can appreciation not be taught in the same sense as facts and skills?
4. What is it that makes a poem, a painting, or a selection of music most beautiful?
5. What aspects of appreciation require concentrated drive? What part is more experimental or sensory?
6. What subjects are particularly suitable for developing aesthetic appreciation? Intellectual appreciation?
7. How might appreciation for a poem be strongly motivated for children?
8. What are the chief features of an assignment for teaching appreciation?
9. What are some of the activities in which pupils may profitably be engaged in learning to appreciate a painting? A poem? A mathematical formula?
10. How might one proceed in the matter of finding out children's likes and dislikes? Their respect or disrespect for objects, persons, and things?

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Contains related exercises.

Part Three

ACTIVITIES AND TECHNIQUES OF TEACHING

Teaching is a complex activity involving knowledge and technique of a high order. It has its specialized techniques that are not characteristic of other professions. As the teaching act goes on, teachers are found planning, organizing, and preparing for teaching, managing the pupils, presenting ideas to them, assigning lessons, directing study activities, conducting recitations, discussions, drills, reviews, and examinations, and providing for diagnostic and remedial work. Throughout his activities the teacher is explaining, questioning, and directing. As a personality he influences the pupils; as a technician he succeeds or fails in accordance with his grasp of fundamental principles and his skill in the use of necessary techniques. In Part Two the principal activities of the teacher are analyzed and discussed in the light of present knowledge of fundamental principles of teaching. While this analysis is related to previous treatments of teaching, an attempt has been made to supplement the older discussions in the light of changing conceptions of the teaching process.

Chapter X ORGANIZATION AND MANAGE- MENT OF THE CLASSROOM

To gain the cooperation of the pupils in a classroom and to manage and organize the work and play so that the activity which we call teaching may be profitable to the teacher and pupils alike is one of the first objectives of the beginning teacher. Even the layman knows that organization for work and play in the school is one of the first necessities. Knowing little about teaching in its more complicated aspects, he judges its effectiveness on the basis of what he observes of its more mechanical phases. If the school is well organized and pupils are busy, if no lack of management appears such as is evidenced in the work of the young teacher when he fails to maintain what is called "discipline," the layman judges that all is well and that the teacher is competent.

Principals, supervisors, and superintendents also are generally concerned first of all with the ability of a teacher in organization and management, for they realize that without them the school is quickly subject to criticism by parents and public in general. They know that good teaching cannot go on when children are unguided and undirected, and that one of the first qualifications for teaching is the ability to manage and control the classroom in a manner similar to that in which good society is guided and controlled by custom and law. One of the first tasks of the beginning teacher is to learn what is known about economical and effective management.

THE NATURE OF MANAGEMENT

Management is the art of organizing the classroom so that work and play go forward without unnecessary loss of time and energy due to poor arrangement of equipment, poor manipulation of materials, and the failure of pupils to be cooperative in whatever type of activity may be undertaken for the welfare of the group.

The management of the classroom includes the use and care of floor space, light, heat, and ventilation; the arrangement of seats, desks, cupboards, bookcases and other furniture; the care and use of books, paper, pencils, blackboard, crayons, maps, globes, and other apparatus; and the adoption and administration of a plan for the management of the pupils as a group of beings associated together for the common welfare.

It is apparent, therefore, that management might be discussed as having to do mainly with equipment, materials of instruction, the physical plant, and the pupil personnel. The most important of these four types of management is that which is concerned with the personnel. Many teachers fail in the latter who are fair or good in the former. Basic to success in personnel management is a thorough understanding of children and sound training in the organization of classroom activities so that each child finds satisfaction in attendance. Management of the physical plant, of equipment, and of materials helps in making a good school. A teacher, however, may be an excellent housekeeper and manager of material things and still fall short of complete competence because of his failure to understand and manage children effectively.

Management and Waste. Classroom management is, in its control of the physical plant and the materials of instruction and in its management of routine affairs, comparable to management in business. In a well-conducted store, light, heat, and ventilation are carefully attended to; goods are arranged in an attractive fashion and in a manner calculated to promote efficiency in handling and replacement; the clerks and other helpers are subject to supervision and required to be neat, orderly, and courteous; and accounts are carefully kept of the receipts, the expenditures, and the profits which should arise from a well-managed business. In a like manner, the school must make effective use of the plant, the equipment, and the time of its members in order that a profit may accrue to

the community in terms of better boys and girls, who are learning constantly to manage themselves better and who are engaged in the development of the powers and capacities inherent in them. A teacher who is a careless and slovenly manager of the school viewed as a business is adding to the cost of public education and is not a profitable employee. Care must be taken to prevent waste of both human and other materials, to conserve time, and to increase the benefit of education to the community through expert management. Good school management is a basic essential.

Cooperation Is Necessary. The management of a school is no better than the management of the sum total of the individual classes of which it is composed. The teacher's duty to his principal requires that he conform to general directions concerning such matters as opening time, dismissal, recess periods, passing through halls, conduct on playgrounds, in gymnasium, in auditorium, and on the street, and other practices necessary to keep a school free from distracting influences. Children from a disorderly classroom spread their influence in the halls and on the playground. It is, therefore, the duty of the teacher to teach his pupils to observe such general rules as are necessary to obtain proper coordination among all those personalities who compose the school.

Formal and Informal Methods. Informal methods of management are thought to be better for the individual than the highly formal and militaristic methods of the past. The small school can make use of methods which may be less formal than those in large schools where masses of children must be moved from place to place.

The presence or absence of marching and countermarching is not, however, the mark of either a good or a poor school, nor is all formal management bad. In recent years informality in management has increased and formality has lessened. In general, the need for formal methods of management seems to increase with the size of the group involved.

The Newer Philosophy of Management. Control of the classroom from the standpoint of good conduct, orderliness in passing, courtesy, and the like, is only the mechanical aspect of management. Management extends into control of the curriculum, the methods employed, and the effective use of the pupils' time in school and out. Control of the classroom in its mechanical aspects is a condition necessary to guiding the learning of the pupils in effective

ways. Control cannot be separated from the whole complex problem of educating the child.

The philosophy underlying the education of children which prevails in a school determines the type of control used there. Militaristic methods mean, generally speaking, an authoritarian type of philosophy and a lack of sympathy with children. Democratic methods mean a belief in the essential goodness of children and the efficacy of learning through living together in a democracy to become good members of an adult world. The best type of control is that based upon learning, through participation in a democracy of childhood, how to conduct oneself effectively in a social environment in which an individual gains as much freedom as he shows himself capable of assimilating.

THE TEACHER'S EQUIPMENT FOR MANAGEMENT

The success which the teacher has in classroom management depends upon certain factors, among which are personality, preparation for teaching, the type of school which is to be taught, the type of community, the curriculum, the general method of instruction, the types of examinations given, and the teacher's attitude toward and sympathy with the various outside activities of children. Power to organize routine matters is, of course, also involved.

Personality. The personality of the teacher must be pleasant, his knowledge of his subject must be good, the school must be physically clean, healthful, and manageable, the community should be orderly and favorable to teaching, the curriculum must be attractive, the general method of instruction must be in agreement with the laws of learning, examinations must be just and fair, and the teacher must show sympathy for the various interests of children if he is to succeed in having the highest type of management. If any one or any combination of these factors is unfavorable, the problem of management is increased in difficulty.

Knowledge of Children. A knowledge of children based upon experience and upon acquaintance with the psychology of childhood and adolescence is especially necessary for sympathetic understanding and successful management of them. The teacher who dislikes children and does not understand them, even though his dislike may be secret or unconscious, will have difficulty in obtaining the confidence and loyalty which are so necessary to successful

management. Children may outwardly conform to the regulations of the school and obey under compulsion without learning the lesson which should be obtained from experience with good management. Secret resentment of authority and a tendency to become unrestrained in personal conduct when out from under authority, may follow attendance in a school which is ruled by an iron but unsympathetic hand.

Ability to Manage Routine Affairs. The teacher must develop the ability to manage the routine affairs of the school. Mechanical things that can be reduced to a routine should be quickly singled out and managed in that way. Passing through halls, distribution of supplies, papers, etc., should be organized so that a minimum of time and energy is required in their administration. Children should be enlisted as helpers in the management of the school, and as many tasks should be delegated to them as possible. Committees may be used for the management of such things as control of heat, light, and ventilation. Individual pupils may be made responsible for the care of flowers, apparatus, passing and collecting of materials, direction of passing traffic, etc., in a manner beneficial both to them and to the school. It is a mistake for a teacher to neglect to think out good ways of managing routine affairs and to neglect to engage children in cooperative management.

Ability to Use Management as a Means to an End. The teacher must use management as a means rather than as an end. As has been implied in the preceding discussion, the function of classroom management is to set the stage for effective teaching and learning as well as to give pupils experience in managing a cooperative group enterprise. To think of good management as an end in itself is to have a very narrow view. It is necessary to regard management as chiefly concerned with improvements in the social adjustments necessary to living in a democracy.

In the classroom the child will get many of his ideas concerning proper conduct toward his fellow beings out of school as well as in it. If he is controlled by a teacher in a strictly militaristic fashion, he may learn to conform to the routine under compulsion without ever learning the lesson of cooperative living. What he needs to meet here is a normal human situation in which he is a cooperative agent. He must learn to assume responsibilities, to realize that he must control his own individual desires in the interests of the welfare of the group as a whole. He must develop good

ideals of conduct. He must learn that good order, cleanliness, good health, courtesy, kindness, unselfishness, and the preservation of an atmosphere of worthwhile work and play are priceless in themselves and that they further his interests in every way. He will learn these lessons best if he is made responsible for a share in the management of the classroom, just as every child in a good home has a share in the management of the life of the home. He must have free social intercourse with his fellow students under sympathetic guidance from the teacher. Restraint is placed upon him only in those matters where his individual desires may conflict with the welfare of the group as a whole. Thus management becomes a means of educating the child in worthwhile habits and attitudes that are important to effective living.

Ability to Develop the Right Attitudes. Attitudes exercise important controls over conduct. If the teacher conducts the affairs of the classroom in an orderly and effective fashion, the pupils will soon base their attitude on the realization that orderly methods are best and will desire to have the work of the class proceed in a systematic and effective fashion. Among the good habits which should naturally follow are: habits of beginning work promptly, of getting materials in order, and of persevering in work until it is finished. Habits that relate to routine affairs of the school will also be developed. Pupils will come to enjoy and favor economy in matters of this kind, if the teacher consistently seeks to develop cooperative attitudes among them. Conversely, careless, slipshod management will soon lead to disrespect for, and lack of faith in, the teacher, at least among the more intelligent pupils.

Ability to Prevent Disorder. It is the function of the teacher to establish a situation in which good order is the common thing. Disorder is the sign of something fundamentally wrong. Thoughtful management prevents disorder. Inexperienced or weak teachers, in their attempts to be friendly with children, sometimes disregard the pranks of the mischievous and hope to get along with them in that way. This is a sure means of laying up trouble for oneself. The beginning teacher will do well to note all signs of disorder when they first appear, to single out those who are responsible, to make known his disapproval, and forever after to persist in trying to remove the cause.

A common cause of disorder, however, lies in the fact that the teacher does not succeed in keeping the pupils busy with well-

planned activities and that in the absence of direction of a worthwhile type, the children introduce discordant elements. Classroom management can never be merely a matter of keeping order and nothing more. Doing things in a systematic and effective manner merely for the sake of organization itself is beyond the interest of most children. The things themselves must be worth doing for their own sake.

Ability to Establish Morale. The teacher must be able to establish and maintain classroom morale. Some children have very low ideals of conduct; some lack self-confidence and initiative in conducting their own affairs. The work of the classroom may be so managed that the pupils who are boisterous and selfish may learn to be unselfish and cooperative, the timid may learn to develop courage, and all may learn the lesson of cooperative living. The morale of a class is that intangible but very real thing which we call the class spirit. A good morale means that the pupils are cooperative, courteous, and genuinely interested in their activities. This spirit is present in well-managed classes and absent in those poorly managed.

Ability to Eliminate Waste. Efficient management eliminates waste. Waste of time, materials, and human effort is possible in the classroom. It is little short of criminal to force children to go to school and then so to manage their affairs that they fail to make progress in the development of high ideals, right attitudes, worthy interests, and effective habits and skills. The ideal of good management should be to manage every class period effectively and economically so that no time is lost in attending to physical conditions, in the distribution of supplies and materials, and in adjusting the individuals of the class quickly to the task in hand in order that the objectives which are present may be reached without loss.

Ability to Lessen Strain. Efficient management relieves the strain of teaching. A teacher who is constantly concerned with the details of management, who is never certain of the orderly conduct of her pupils, faces one of the most nerve-wearing and difficult tasks in the world. Young teachers are often quite miserable while they are learning the lesson of management. It is well, then, to attempt to learn all that one can about good methods of management before entering upon teaching in order to avoid unnecessary wear and tear.

CHANGES IN THEORY OF CLASSROOM MANAGEMENT

Theory of classroom management has changed to a marked extent in recent decades. When teachers were less well trained in teaching and in their subjects than they are at present, they were much concerned with management, and tried to make up with good management for what they lacked in other ways. Ingenious schemes were developed. Many rules were formulated and much was written on how to get order and to keep it. Changes in the curriculum and the methods of public education and in knowledge concerning the nature of children and their methods of learning have had marked effect upon management. *The Hoosier Schoolmaster* reflects the ideals of a generation for which one of the chief sports was the baiting of a young or weak teacher by the bullies of a neighborhood. In those days "order" was maintained by sheer physical force or by the more important fearless spirit which by some magic of the eye and voice enabled teachers to "control" those who were often physically stronger than themselves. The majesty of the law also was long invoked as a means of keeping children at least outwardly acquiescent to the authority that belonged to the teacher. This was due to the fact that the teacher stood *in loco parentis* and represented the almost complete authority over children which lay in the father of the family. That the method of authority was often a failure many adults of middle age today can testify.

Today there is a marked change. The tendency is to regard management as a problem of education as a whole. Management must not be wholly enforced from without the child, but must rather start from within. Thus it may be said that there are two basic types of management to be found in the schools: (1) the older or militaristic type which was inherited from the past; and (2) the modern or democratic type, which is based upon the theory that pupils learn how to manage themselves through cooperative effort directed by the teacher.

Democratic Management. Democratic management rests upon the idea that pupils will benefit most when they have a part in the management and learn to become responsible for it. It is more friendly and more in keeping with our democratic theory of life than the authoritarian view. Attempts to establish democratic man-

agement may, however, be good or bad. A teacher may overestimate the ability of children to manage themselves and thus fail to exert the direction and guidance that are essential in the development of immature human beings. Children should have as much freedom as they can exercise at any one time. If they can organize their activities in such a way that a minimum of teacher-control is necessary, so much the better. But a share in the management of their affairs must be given to them only as they are able to profit by it. Some rules will have to be made. Some restraint will have to be exercised, and some customs which are found good for people in groups to observe will have to be established. The important point is that the teacher shall gradually put more and more trust in the children and that they shall assume more and more responsibility in the management of their affairs.

TECHNIQUES OF CLASSROOM MANAGEMENT

Certain effective practices in the management of the routine affairs of the school make effective teaching possible. These practices may be designated as techniques of classroom management. They have to do with the routine affairs and with matters that occur again and again and require little change. Accordingly they should be reduced as soon as possible to the habit level in order to leave the minds of the teacher and the pupils free for more important matters.

Let us assume that the teacher is going to a new school and must prepare to teach effectively from the first day. What specific techniques should he employ?

Getting Acquainted with the Classroom. First of all the teacher should become thoroughly acquainted with his classroom and find out where things are. He should visit the school before the opening session and ascertain what he has to work with. He will do well to examine the building to find the location of toilet facilities, the means of access to the building, the location of playgrounds, auditorium, library, cafeteria or lunch room, etc. Then he should visit his room and examine it critically, learn about the heating and ventilating system, examine the lighting, see whether or not the curtains will work, and see that books, maps, and charts are available and arranged for most effective use. He should then plan to make the room as attractive as possible by adding any decorative

touches that he may desire. He should see that paper, pencils, ink, chalk, erasers, etc., are available and ready for use. It goes without saying that he should then plan the work for the first day carefully in order that the work may start off effectively and that he may create a good impression on his pupils.

Seating the Pupils Effectively. Great changes have taken place in classroom seating in the last few years. The long rows of seats of the traditional school are being replaced in many schools by a less formal arrangement. In the primary grades an effort is being made to deformatize seating by the use of long tables and chairs, or by smaller tables at which groups of five or six pupils may be seated. Whatever system of seating is adopted, it is well for the teacher to attempt to learn as soon as possible about the physical limitations and characteristics of his pupils, and to seat them so that those who have poor eyesight or hearing may be near the front of the room and those who are likely to be troublesome may be nearer to him. The first-day pupils may be allowed to choose their own seats and then as the teacher learns more about them, he may change the seating until he finds a better combination.

There is some reason to believe that children who are seated near the front or the windows of an ordinary classroom have an advantage in certain types of work over those on the dark side and to the rear. Changing of the seats at intervals may be desirable and advantageous, but a fixed seating arrangement soon becomes habitual to children, and when properly planned makes one less problem to think about and thus leaves time for other affairs.

It will be advantageous for a teacher who must handle a large number of children to make a chart of his room for each class and to write the pupil's name in each square representing a seat. He can thus quickly familiarize himself with the pupils' names.

Grouping children into ability groups or into several small study groups, as is practiced in some schools, makes it necessary to study carefully the most advantageous placement of such groups in the classroom. The necessity of fitting children with seats and desks somewhat closely adapted to their physical size also complicates the matter of seating. It will require care and thought on the teacher's part to adjust all these matters satisfactorily.

Moving about. If classes were composed of a few pupils and schools were small, there would be little difficulty with the passing of children in and out of school. In large schools, however, there

must be a plan for passing to and from classes and in and out of the building. Formerly children were marched in military formation in most schools. There is a tendency today to try to move them in and out of the building without this marching procedure. In the classroom itself some systematic way of having children get ready to go home and out for intermissions will avoid confusion. In many schools a system of marching is required. Some teachers have the pupils obtain wraps by rows and then line up for dismissal; others dismiss pupils informally, insisting only that they shall act like a group of well-behaved adults in getting in and out of the building. The latter method is undoubtedly more in keeping with the practice of adults and if possible should be favored. Unnecessary formality in matters of this kind often creates disciplinary problems which could be avoided. On the other hand, if the informal method is tried and found wanting, there can be little objection to asking children to walk out quietly in lines. Necessary disciplined action is in keeping with the spirit of democracy.

Distributing Books and Supplies. In the interest of economy of time it is well to have the distribution of books and supplies planned so that it takes little time from the more important business of learning and teaching. It is justifiable to have pupils share in such routine matters. They may be appointed in rotation for this responsibility so that all may participate. Pupils enjoy the activity of helping, and get training from it. The use of pupil help will save valuable time.

Taking Care of Physical Conditions.¹ Regulating the light, heat, and ventilation, keeping the blackboards clear, picking up paper and other material which may give the classroom an air of disorder—all these matters may be managed by committees, by monitors, or informally, as may be desired. The authors favor making the children responsible in so far as possible for light, heat, ventilation and other matters of this kind. It may cause trouble, however, to ask children to wash the blackboards, clean erasers, and pick up refuse unless the community is one in which the parents are servantless and commonly expect children to help with the work of the home. There is a valuable training, nevertheless, in having children take care of matters of this kind, and the

¹ Bills, A. G., *The Psychology of Efficiency*. New York: Harper & Bros., 1943. Pp. 224-26.

teacher should by no means be expected to do all these things unassisted.

Keeping Order. The important matter of keeping order, that is, of preventing pupils from doing things which distract others who are at work, can hardly be turned over to children *in toto*. The teacher will be held responsible by the principal and the parents and must contrive to manage so that little disorder will appear.

It is hardly possible, however, that a teacher will not meet, early in his career, some few children who will be antisocial and will not respond to good incentives. Such children must be controlled by whatever methods are workable. Common devices are isolation of the pupils from the group activity, reprimand, or more severe punishment. In the meantime, the teacher must seek for the cause of disorder and work with the individual to attempt to remove as quickly as possible the undesirable tendency. The basic cause or causes of the trouble must be removed.

Sometimes children can be used effectively as a group to discourage the nonsocial one and make him more amenable to group customs. In the middle grades and above they can be led to set up certain standards of their own for their conduct in school and to develop a group responsibility for good conduct. Unfortunately, however, the strong tradition in this country that the teacher is a sort of police officer leads many parents to aid and abet their children in disorderly conduct by reciting their own adventures as youths in getting the best of a weak or disliked teacher. In the last analysis, the teacher is responsible for setting up high ideals of schoolroom conduct and for seeing that order is maintained. It is better to substitute group action for authority; but if authority is challenged it must be maintained.

A good practice is to make rules concerning conduct only when necessary, and to see that such rules when made are scrupulously observed without fear or favor to any child. Having mechanical details as much as possible reduced to a routine aids in preventing disorder, and setting up by group action certain standards of conduct in general takes care of those situations which are not specifically taken care of by routine procedure. Such a set of standards might be somewhat as follows:

1. Children with good manners speak in low voices and laugh in moderation.
2. When a group of children are busy on a common task, it is not good

- sportsmanship for any member of the group to do things which detract from the main business of the group.
3. Quiet is necessary when pupils are studying. It is not the part of a good citizen to interrupt this necessary quiet.
4. In a group discussion it is necessary to have a leader. Members of the group should not address the group until they have the permission of the leader, unless it is an informal, friendly discussion.
5. In moving about the room a child with good manners goes as quietly as possible.
6. Sharpening of pencils and obtaining of materials should be taken care of when it will not disturb others.
7. Good manners demand that the teacher be addressed as "Mr. or Miss _____", and that other members of the group be addressed by their proper names. Such expressions as "Please," "Thank you," "Pardon me," and the like are often heard among well-trained children.

THE MANAGEMENT OF BEHAVIOR PROBLEMS

The term "discipline" was once much more prominent in educational discussions than at present. The theory of formal discipline which dominated educational philosophy for a time was that it did not matter what pupils wanted; their part was to submit gracefully to the will of adults. Education was a process of overcoming in the individual the tendency toward disorder and undesirable traits of various kinds. Today discipline is not approached directly as a major concern of education. That does not mean that teachers are any less interested in having children develop good habits and conduct themselves in a proper fashion, but rather that the theory of discipline has changed.

Discipline for the individual comes largely from within rather than from without. There is discipline in group living. Each subject and each activity carries with it its own discipline, and the child learns how to conduct himself favorably through a succession of experiences. In the narrower sense the term "discipline" refers to the handling of cases of disorder, bad manners, and more serious character defects which make their appearance among children now and then even in the best of schools.

If all pupils came from good homes and had good home training, there would probably be little occasion to speak of discipline. The preschool period is most important in the developing of good character traits. The same kind of conduct that causes a baby to be a nuisance to its parents and associates causes a child in school to revolt against school customs and become a problem to the teacher.

Good conduct is a community and home problem as well as a school problem. The teacher needs to study the community and home life of his pupils in order to know how to handle cases of discipline.

Types of Behavior Problems. Even in the best regulated schools there are children who cause the teacher difficulty. Some of the common, less serious, types of disorder are whispering, laughing at inappropriate times, clowning in order to draw attention, practical joking, and discourteous language. The more serious character deficiencies are dishonesty, sex aberrations, malicious destroying of property, etc. It must be recognized that the manner in which a child conducts himself is a reflection of his environment. Children are disorderly, discourteous, and the like for specific reasons that originate in their past experience. Some children are disorderly because they crave notice; some are disorderly because of basic character defects, such as ill temper, or a lack of cooperativeness toward any person in authority over them. Whatever the cause, the teacher must seek for and attempt to get at the basic character defects.

Less Serious Problems. The ordinary behavior problems should not cause the teacher serious difficulty if he will remember that children generally admire a person of authority and certainty; they are easily guided by a person of spirit. Moreover, the teacher can depend in general on the fundamental goodness of most children and have confidence that if he is kind, honest, industrious, and desirous of guiding children in profitable experiences he will have little trouble with disciplinary cases. Temporarily, while children are seeking to understand him, he must give the impression of firmness and certainty in his conduct and must even use force, if necessary, to cause children to conform to standards of good conduct; but to depend upon force alone is a serious mistake. The influence of the total situation must ultimately control the conduct of the children in the group. A teacher who is weak in character himself can scarcely hope to become a good leader of children.

Serious Behavior Problems. The serious behavior problems are, however, a different matter. They require careful study on the teacher's part and are not easily solved. A great deal of help may be gained by the teacher if he will study such books as, *Your Children at School*.² It may be said that teachers do not always

² Hubbard, Elizabeth V., *Your Children at School*. New York: John Day Co., 1942.

recognize the seriousness of the conditions which cause maladjustments among children. A glance at the list of behavior problems in Table 1 reveals that fact. It appears that teachers are more concerned about the harmful influence of overt acts of behavior, such as stealing and the defiance of authority, than they are about the maladjustments caused by the less overt forms of behavior among children. Clinicians, on the other hand, are more concerned about the seriousness of unsocial acts, such as withdrawal, suspiciousness, and similar forms of behavior than they are about the possible bad influence of the children who use obscene language, steal, or defy authority. Evidently teachers are much more orthodox than clinicians in their judgment of what is and what is not misconduct and tabooed forms of behavior. They overlook, however, the eventual harm which may arise from the potentially maladjusted cases found among the quiet and reticent children in the classroom. Naturally no person should make the mistake of assuming that the shy and reticent children are the only ones who become potential criminals. Yet it cannot be too strongly emphasized that teachers should keep a watchful eye on these particular types of children in the classroom and on the playground.

Table 1 contains a number of behavior problems which are arranged in order of their seriousness from 1 to 50 by teachers and mental hygienists. In reading the list of problems, it will be noticed that "stealing" is ranked "1" by school teachers and "13" by mental hygienists; "heterosexual activity" is ranked "2" by school teachers and "25" by mental hygienists; and so on to the last one in the list, which is "whispering." It will be noticed also that it is ranked "50" by the Denver teachers and the mental hygienists and "47" by Wickman's teachers. The agreement on this one behavior problem and several others is quite good by both school teachers and mental hygienists. But on other behavior problems given in the list, the data of the table reveal that there is no such good agreement.

It has been shown that teachers and mental hygienists differ in their opinions as to the seriousness of behavior problems among school children. A person may wish to ask: why should they agree when they do not have common criteria for judging the immediate influence of conduct on classroom work and school life in general? In all probability, if school teachers and mental hygienists were on common ground for judging the seriousness of children's behavior,

Table 1. Rank-Order Arrangement of Behavior Problems among School Children ^a

TYPE OF BEHAVIOR PROBLEM	DENVER TEACHERS	MENTAL HYGIENISTS	WICKMAN'S TEACHERS
1. Stealing	1	13	1
2. Heterosexual activity	2	25	2
3. Unreliableness	3	21	12
4. Untruthfulness	4	23	5
5. Cruelty and bullying	5	6	8
6. Cheating	6	24	9
7. Unhappiness	7	3	22
8. Unsociability-withdrawal	8	1	40
9. Masturbating	9	41	3
10. Suggestibility	10	8	28
11. Temper tantrums	11	17	13
12. Obscenity in notes, pictures	12	28	4
13. Destruction of school material	13	45	10
14. Easy discouragement	14	7	23
15. Selfishness	15	16	24
16. Impertinence	16	37	7
17. Resentment	17	4	29
18. Nervousness	18	19	20
19. Quarrelsomeness	19	31	27
20. Disobedience	20	42	11
21. Domineering	21	11	33
22. Impudence	22	32	16
23. Laziness	23	36	17
24. Fearfulness	24	5	36
25. Carelessness	25	38	25
26. Sensitiveness	26	10	48
27. Truancy	27	22	6
28. Physical cowardice	28	15	31
29. Overcritical regard for others	29	9	45
30. Sullenness	30	12	35
31. Slovenliness	31	35	34
32. Suspiciousness	32	2	37
33. Shyness, bashfulness	33	14	50
34. Lack of interest	34	26	14
35. Stubbornness	35	20	32

^a Ellis, D. B., and Miller, L. W., "Teachers' Attitude and Child Behavior Problems," *Journal of Educational Psychology*, Vol. 27 (1936), pp. 507-11. Used by permission of the authors.

Table 1. Rank-Order Arrangement of Behavior Problems among School Children (*Continued*)

TYPE OF BEHAVIOR PROBLEM	DENVER TEACHERS	MENTAL HYGIENISTS	WICKMAN'S TEACHERS
36. Enuresis	36	27	19
37. Thoughtlessness	37	39	38
38. Tardiness	38	43	30
39. Inattention	39	34	26
40. Profanity	40	47	15
41. Inquisitiveness	41	44	44
42. Dreaminess	42	18	41
43. Disorderliness	43	46	21
44. Tattling	44	29	46
45. Imaginative lying	45	33	42
46. Smoking	46	49	18
47. Silliness	47	30	39
48. Restlessness	48	40	49
49. Interrupting	49	48	43
50. Whispering	50	50	47

there would be better agreement in the matter than there is. The solution of this problem awaits further study.

Teachers' Observation and Treatment of Behavior Problems. Campbell ⁴ reports the observations of teachers in grades one to six, inclusive, on behavior problems. The results of this investigation are given in Tables 2 and 3.

From an inspection of Table 2, one may infer that teachers do not observe the more serious forms of children's behavior because of the immediate distracting influence of the overt forms. That is understandable when the reader realizes that teaching is, in part, dependent upon good discipline.

Censure and extra work constitute 55 per cent of the techniques of punishment. Constructive or nonpunishment techniques comprise about 25 per cent, and deprivation as a technique of punishment is used 19 per cent of the time.

Campbell's study confirms the tendency among teachers to consider offences against the order and discipline of the school as of first importance. To mental hygienists items 4, 5 and 6 of Table 2 are of far greater significance.

⁴ Campbell, N. M., *The Elementary School Teacher's Treatment of Classroom Behavior Problems*. New York: Teachers College, Bureau of Publications, 1935.

Table 2. Classroom Behavior Problems as Reported by Teachers ⁵

TYPE OF BEHAVIOR PROBLEM	NO. TIMES OBSERVED	PER CENT OF TOTAL
1. Violation of classroom order (disturbing others, making noises, attracting attention, talking)	501	40
2. Difficulties with authorities or rules (disobedience, chewing gum, passing notes, rudeness)	191	16
3. Difficulties in application to work (inattention, untidiness, tardiness, lack of preparation)	272	22
4. Aggression toward other children	167	14
5. Immorality	96	8
6. Withdrawing and recessive personality traits	3	0.2

Table 3. Treatment of Classroom Behavior Problems as Reported by Teachers ⁶

TREATMENT OF BEHAVIOR PROBLEMS	NO. TIMES USED	PER CENT OF TIME USED
1. Censure (Scolding, sarcasm, ridicule, threats)	1,242	46
2. Extra work (Kept in, required repetition, new task, replacement or repair)	248	9
3. Physical force	26	0.8
4. Deprivation (Change of seat, sent to corner or out, denied privileges)	502	19
5. Ignoring	33	1
6. Verbal appeal or reasoning	257	10
7. Reward through social approval	122	4
8. Assistance in meeting situation	249	9
9. Reward through privilege	36	1

Campbell concludes from her study that when children reveal undesirable classroom behavior, teachers apply direct measures of punishment and reward instead of some constructive means of control. It does not seem to occur to them that some indirect measures may operate more satisfactorily to all concerned. Rarely is there evidence in these findings of an attempt to study the individual

⁵ Used by permission of N. M. Campbell.

⁶ Used by permission of N. M. Campbell.

pupil in order to discover the underlying cause of his maladjustment. Teachers are more concerned about removing the disorder than they are about removing its cause. Mental hygienists are more interested in removing the cause.

Furthermore, according to Campbell, the teachers who are rated the most successful in classroom control employ rewards and direct help while the teachers who are rated less successful employ punishing devices to gain control of the situation.

The Prevention and Treatment of Behavior Problems. Good management prevents disciplinary problems from arising; conversely, bad management leads to bad conduct. The well-ordered school demands good order from its members. The teacher who has his work poorly organized, who lets each day's problems settle themselves as they arise, and who refuses to spend time in thinking and planning is bound to have trouble with the discipline of his class. The remedy is for him to make a settled routine of mechanical matters, to have a definite program of activities, to enlist children's help in management and to aid them to learn how to manage themselves profitably. Some children who are potentially disorderly may be enlisted as aides in management; committee memberships, monitorships, reports, discussions, and dramatic and other extracurricular activities may be used to train children in good management of their own affairs. Children will respond to the incentives of leadership, approval of the group, approval of the teacher, and success in projects and activities. Negative incentives such as scolding, corporal punishment, isolation, suspension, expulsion, etc., are now being more and more rarely used. The dunce cap, the ferule, standing in the corner, sending the child to "the office," and such devices are seldom used in a modern school. The teacher looks to the activities, the method, and the group morale as the important sources of control of individual conduct.

When management fails, the teacher must look to the fundamental organization of his teaching activities in order to find the secret of the difficulty or to the fundamental character defects of his pupils as well as to his own character traits, his attitudes, and his methods of teaching.

Penalties for Misconduct. Penalties when used as a remedy for bad conduct should be natural results of the misconduct. If a child cannot take part in group activities without disorder, he may be isolated from them until he is willing to take part effectively. If a

child is discourteous, he may not be allowed to talk until he is willing to be courteous. Corporal punishment and even slighter forms of physical contact with children should be avoided until it is determined that the given child knows no other authority and will respond to no other incentive. In many schools this method of primitive days is rightly prohibited. Under most circumstances it is only the last resort and very doubtful as means of procuring a real reform in the attitude of the culprit. It is, of course, true that some few children are of such poor intelligence that it is of little value to appeal to reason with them. In such cases restrictive measures are necessary.

EVALUATING THE OUTCOMES OF MANAGEMENT

The results of good management are a well-run school and a happy and cooperative group of children. These are achieved if the teacher observes sound principles of management.

Principles of Good Management. What is a well-conducted school and what is good management? How may a teacher know when his class is well managed and when it is not? There is at the present time no objective way of measuring good conduct. It is possible, however, to set up certain standards for the use of the teacher so that he may appraise the effects of his efforts to conduct a well-managed school. A suggested list of principles of good management follows.

STANDARDS OF GOOD MANAGEMENT

In a well-managed classroom the following conditions exist:

1. There is a well-organized program of activities.
2. The arrangement of the classroom is attractive and orderly. Supplies are well arranged and easily obtained.
3. There is a well-organized plan for passing of books and supplies.
4. There is a definite plan for taking care of light, heat, and ventilation. Pupils have a part in this activity.
5. There is a definite set of standards of conduct to which the pupils give their support.
6. Children have good manners and speak in low, courteous voices except when engaged in natural play where shouting and laughter are appropriate.
7. The teacher is as courteous in voice and manner as any well-bred person would be in his own home.
8. There is a spirit of cooperation between teacher and pupils. Pupils volunteer to help each other and the teacher.

9. There is good housekeeping; the room is always orderly and is as attractive as possible because of the good taste of teacher and pupils.
10. Problems of disorderly conduct seldom appear. When they do they are handled as offenses against the group welfare and not against the teacher personally.
11. Positive incentives to good conduct are used; negative incentives are conspicuous by their absence.
12. Pupils are happy and industrious; there is a spirit of group loyalty and of well-being.

Check lists to determine whether or not good management may be present in any given classroom are available in *Directed Study and Observation of Teaching*.⁷

Results of Good Management. The outcomes of good management are to be sought in the possession of desirable character traits among the children who have been members of the class. These consist of good attitudes toward the teacher, the school, fellow students, the curriculum, and the activities. Permanent interests in school activities should result from good management. Evidences of enjoyment should be obvious. Likewise, the possession of good habits and skills should follow good management. Children should have habits of cooperation, industry, loyalty to group, the use of books, the habit of study, and good personal habits. Certain skills and abilities should also arise from good management; ability to take part in group discussions, to respect the rights of others, to do one's share in a cooperative enterprise, to take care of light, heat, and ventilation, to organize activities, to find materials, to arrange, classify, and preserve materials, to use the library, the dictionary and other aids to knowledge, to take part in an argument amicably, and to observe the customs followed in a polite society. Negatively, children should have learned to control their tempers and to avoid dishonesty and discourtesy in their dealings with their fellow students.

STUDY QUESTIONS

1. In what ways has the theory of classroom management changed in the last two decades?
2. Define classroom management.
3. What is routine management?
4. What is business management?
5. What is personnel management?

⁷ Yoakam, G. A., and Simpson, R. G., *Directed Study and Observation of Teaching*. New York: The Macmillan Co., 1934.

6. Which type of management is most difficult?
7. What factors make for success or failure in management?
8. What is the fundamental function of management in the modern school?
9. What part should children have in management?
10. What two contrasting types of management are treated in this chapter?
11. Discuss the theory of democratic management.
12. What are techniques of management? Discuss techniques to be used in managing routine affairs of the class.
13. What changes have taken place in the theory of classroom discipline in recent years?
14. How may the teacher judge the effects of his management?
15. Name some of the most important educational outcomes of good management.

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11. YOAKAM, G. A., AND SIMPSON, R. G. *Directed Study and Observation of Teaching*. New York: Macmillan Co., 1934. (Revision in preparation.)

Contains related exercises.

The art of lesson-planning has been undergoing many changes in the past few years. Instead of the time-honored daily lesson plan, many teachers have been experimenting with longer unit plans, course outlines, and the like. Even though planning has changed in many respects, there has been no lessening of the importance of effective lesson-planning in good teaching. Routine management is important and indispensable. In lesson-planning, however, the teacher comes into his own as a director of learning activities. All that he knows about his material and all that he knows about children must be used in the planning of lessons of whatever type they may be.

Prerequisites of Lesson-Planning. Knowledge of subject matter, children, and method, and understanding of the aims and purposes of education, determine how well a teacher can write his lesson plans. Adequate training in subject matter as a part of his preliminary training is obviously essential as a prerequisite of lesson-planning. No teacher can map out a proposed unit or write even a single daily plan without knowing thoroughly the field in which he is working. Even though in the elementary school the use of subject matter may be limited in scope and detail, it is not safe to assume that the training of the teacher in history, English, arithmetic, elementary science, geography, etc., should likewise be limited. Because of greater specialization, the high school teacher must go more deeply into his subject or subjects, but the elementary teacher needs likewise a broad general background and special knowledge of the teaching of skills—reading, writing, spelling, composition, art,

music, and physical training. His preparation can scarcely be adequate short of a four-year college course.

Knowledge of children gained from direct contact with them and from a study of child psychology is correlative in importance with a knowledge of his subject in planning lessons. He must not only know the facts of history but he must know what history will be meaningful to his pupils and how to organize his materials in a psychological rather than merely a logical fashion. He must understand children's traits and interests in order to know how to plan for them.

Understanding of method is a third essential prerequisite. If the teacher thinks of method as something apart from subject matter and from children's ways of learning, he may make the mistake of trying to use a method too mature for the children or foreign to their ways of thinking and acting. Knowledge of method necessitates a thorough grounding in the psychology of learning as well as a sound philosophy of education and an adequate knowledge of sociology and educational biology. With this background the teacher will not become a mere worshipper of devices.

A basic understanding of the aims of education, especially as modified by educational science, philosophy, and biology, must be a prerequisite for good lesson-planning. Otherwise the teacher will slip back into the practices by which he was taught and no progress will be made in improving either teaching or learning.

The Necessity of Lesson-Planning. Some kind of lesson-planning must be carried on by all teachers whether they be novices or master teachers, for it has certain definite functions to perform which are indispensable in good teaching. Lesson-planning forces consideration of goals and objectives, of the selection of subject matter, the selection of procedures, the planning of activities, and the preparation of tests of progress. Lesson-planning involves looking ahead and planning a series of activities, all of which progress definitely toward the modification of children's attitudes, habits, information, and abilities in desirable directions. Without this kind of planning, except by a miracle, there can be no steady progress and no definite outcome of teaching and learning procedures.

Even in the most progressive school, in which children's interests and tastes are followed more closely than in the traditional school, planning is an essential activity for the effective teacher. The form of the plan may change according to the educational

purpose of the planner, but the need for planning remains. Planning prevents waste. It helps the teacher to be systematic and orderly. It encourages good organization of subject matter and activities. It prevents haphazard teaching and goes a long way toward eliminating disorder and other ills of thoughtless teaching.

Good planning helps the teacher to delimit the field in which he is teaching. He decides what to deal with and how to deal with it ahead of time and is not thus subject to exigencies of the moment. It encourages a proper consideration of the learning process and definite choice of appropriate learning procedures. It also encourages continuity in the teaching process. Needless repetition is avoided, and proper connections between different lessons or units of study are provided for ahead of time.

It should be said, however, that planning may have its evil side. If plans are made by others than the teacher and are simply delivered to him to be taught without any choice on his own part as to how they are to be used, the teacher will fail to grow and his powers of initiative and independence may be harmed. Slavish following of a predetermined plan may also cause a teacher at times to fail to take advantage of an unexpected opportunity to develop an interest which otherwise may be lost. Some of the very best teaching may occur when the teacher follows his own nose and develops some activity which he discovers to be ripe for development at that particular instant. It is well to recognize that as teachers grow in experience and efficiency they should also grow in freedom to adjust their plans to the demands of the developing teaching situation.

Forms and Types of Plans. In the modern school, lesson plans may be of various types. The common ones may be enumerated as follows:

1. The short daily plan in a commercial ready-made plan book.
2. Longer daily plans, loose-leaf or in a teacher's private plan book.
3. Term syllabi or outlines, mimeographed or printed.
4. Unit plans, long or short, which treat a large division of a subject or outline a complete activity.
5. Detailed study guides which outline all the activities of a unit in such a manner that it serves as a plan for both teacher and pupils.
6. Mimeographed exercises or daily units which are prepared by the teacher as she proceeds in her teaching.
7. Workbooks—detailed exercises, outlines, etc., which are printed by publishing houses for use by pupils and teachers, and furnish material to accompany the textbook.

8. Hasty outlines or notes jotted down for the moment and changed each time the teacher teaches a lesson.

Each of these types will be taken up and discussed in order.

1. *The Ready-Made Plan Book.* Many superintendents require their teachers to keep a ready-made plan book. These books are furnished by the school district and consist of forms made up of ruled squares, one for each subject and each day of the week. In this plan book the teacher is required to enter a brief description of the work to be done in each subject for each day of the week, a week in advance. Such a record is believed by some administrators to be a necessary administrative device to encourage systematic planning and also to serve as a record of work to be done in case the teacher is ill and a substitute is required. Many teachers resent having to make even such a brief outline of their work in advance. They assume that their preparation in teachers' college or school of education has been sufficient and that they should be able to teach without planning. The experienced, earnest teacher, however, knows that planning is necessary, and he will ordinarily make his own plans even though not required to do so. The ready-made plan book represents the very minimum of systematic planning. Most teachers make more comprehensive plans.

2. *The Longer Daily Plan.* Many teachers write out plans for important lessons comparable to those which are prepared in training schools for practice teaching. Such plans usually cover the following major points:

- a. Aim
- b. Materials
- c. Procedure
- d. Test of progress

Sometimes the plans are made with a two-column arrangement. On one side is the subject matter and on the other the procedures, including suggestive questions. Examples of these plans may be found in the books cited at the end of this chapter. There is undoubtedly a valuable training in self-discipline that comes from writing such plans. The writer of them will seldom teach in a haphazard fashion. Practically, to be sure, it is hardly possible to write such a detailed plan for every lesson the teacher is to teach, and it is also unnecessary. In his period of preparation, however, the teacher should undoubtedly have much training in the writing

of this type of plan. The teacher of a single subject or two should develop a series of plans for the major portions of his work and teach them until he is a thorough master of systematic procedure.

3. *Term Outlines.* The term outline for the work of a single subject has been growing in popularity as a means of obtaining systematic progress in the study of a subject. Such outlines may take on many forms, from a simple logical outline of the subject to a series of carefully worked out lessons with the procedures indicated so that a teacher is never at loss as to what to do next. To proceed by such an outline is undoubtedly better than simply to use a textbook and make hit-or-miss assignments day by day. When the outline is planned for teaching as well as to indicate the limits of the subject, it becomes a useful teaching instrument and leads to a high type of teaching. The working out of such long outlines takes time. Many teachers carry away from their period of training outlines of this type which they use continuously in their teaching. The most serious objection to such plans is that often they are unmodified and do not take into account the present interests and needs of the pupils.

4. *The Unit Plan.* The unit plan takes its name from the fact that it is a teaching outline of a meaningful unit of subject matter or a learning activity of the project type. It may become a study guide for the use of children, if made for that purpose, or it may remain in the hands of the teacher to serve as his personal record of proposed activity. A series of such units will constitute a term, semester, or yearly plan. Such a plan is made by a single teacher or by a group of teachers. It usually contains the following major divisions:

- a. Subject
- b. Aims of the unit
- c. References
- d. Introduction or overview
- e. Outline of procedures for study
- f. Test of progress

Examples of plans of this type may be found by consulting references appended to this chapter.

An advantage of the unit plan is that it represents a careful planning of a unified activity for children. It does away with the hasty daily assignment. Some of the best schools of the country are experimenting with this form of plan and believe that it greatly

improves teaching and learning. In some experimental schools units are written up after they have been completed. These units represent records rather than plans, but they are suggestive and are sometimes worked over in much the same way several times.

5. *The Study Guide.* The printed guide, worked out by a teacher for the guidance of the pupils in study, is often used as a plan for teaching as well as learning, and constitutes the only needed material aside from textbooks, reference books, etc., for carrying out a profitable learning exercise. Such study guides contain the same major divisions as the unit plan. They are mimeographed or printed and are put into the hands of the pupils for use in the study period. When used wisely such guides are often productive of good teaching. The danger in their use is failure to regard them as suggestive rather than compulsory, and to modify them to meet the needs of particular individuals and groups. They must be used intelligently or they fail of their purpose.

6. *Duplicated Exercises.* Duplicated exercises sufficient for a daily lesson or for longer periods are used profitably by many teachers in conducting the work in many of the school subjects. It is a common practice for the teacher to prepare and duplicate them himself. Children seem to enjoy such exercises. They lead to systematic learning and teaching. These exercises resemble practice exercises commonly found in textbooks.

7. *Workbooks.* Commercial workbooks, which generally are organized to furnish enough teaching material for a year or half-year, are taking the place of lesson plans, study guides, etc., in many schools. These workbooks are available for the subjects of reading, arithmetic, history, geography, language, etc. The chief objection to them is that they cause many teachers to stop planning and thinking about teaching and hence to quit growing. The books are valuable when properly used, and help teachers to do systematic teaching while they are organizing materials of their own. Workbooks are used properly when they are used as aids to teaching rather than as textbooks to be slavishly followed by both teacher and pupil.

8. *Hasty Notes.* Scarcely worse than no plans at all are the hasty notes which some teachers make in planning for their teaching. There may be some excuse for these when a teacher is working on several unit plans at once or in the early stages of his teaching when he has too many subjects to teach, but scarcely any excuse

for the experienced workman or the one who takes pride in doing a good job.

Advantages of New-type Plans. The advantage of plans of the newer types, on the whole, lies in the fact that teachers who make them must become thoroughly trained in teaching, and that while making them they grow prodigiously in skill. In new-type planning many difficulties are met, but if the teacher proceeds little by little and persists, he will gradually build up a body of teaching material which will be invaluable. The disadvantage lies in the tendency to use such plans much in the same manner as the traditional textbook.

Features of a Good Lesson Plan. In making any plan the teacher must hit upon some orderly arrangement of materials. Such plans are common in magazines and recent books on teaching. Some follow, in effect, the five formal steps of Herbart—preparation, presentation, comparison, generalization, and application. Some follow the modified technique of Morrison. Others attempt to follow Dewey's analysis of an act of thought. Some are merely lists of problems or outlines of topics. It seems to the authors that the essential elements of any plan are as follows:

1. A statement of the problem or subject
2. Aims of the unit
3. Reference material (selected)
4. Introduction (if needed)
5. Outline of procedure (including suggestive problems, suggestions for study, etc.)
6. Directions for the preparation of papers, talks, etc.
7. Assimilation test by which the student checks his progress
8. Generalization and conclusion

The arrangement of the details of the plan varies with the subject or activity.

The objection to any plan of this type is that theoretically it predetermines what pupils are to learn and gives them no opportunity for freedom and initiative. Expecting children to develop freedom and initiative in the learning of skills and the assimilation of race experience as recorded in history, geography, and the like is, on the other hand, believed by some to be rather a visionary hope and not founded on facts, any more than the traditional emphasis upon subjects and compulsory method was founded upon sound psychological principles. Undoubtedly children learn best

when they are active, but it is the teacher's business to direct them so that they will become active in ways that are profitable to society as well as to themselves. Well-developed plans help to prevent an unplanned curriculum, and when used with intelligence provide adequately for pupil initiative and freedom without neglecting necessary guidance.

It should be understood therefore, that plans of all types should be flexible. It is a serious error to use a plan that obviously does not fit the situation. The teacher plans with as much foresight as possible and then if he finds that he has made a mistake he changes the plan as the situation seems to warrant. That is good sense and it is good teaching.

The Treatment of Subject Matter in Planning. As far as current writings indicate trends in educational thinking, there are now two schools of educational thought quite firmly opposed to each other in their attitude toward subject matter. One group believes in the great value of organized subject matter and feels that racial experience as found in books and in customs of society should be assimilated by children in a systematic fashion. At the opposite extreme are those who feel that organized traditional subject matter has been too much imposed on children and that life and living is the most important subject matter for education. The latter group of thinkers regard subject matter as anything the child may experience. The reader may take his choice as to what he thinks subject matter is.¹ For convenience in this discussion subject matter will be regarded as anything that is useful in the way of experience with which a child may be brought into contact during the process of his education.

In the latter sense it is apparent that the teacher must be well prepared in subject matter. He must know things that children are likely to understand and find of use in adjusting themselves to this changing world. Ignorance of all sorts is deplorable in a teacher. The teacher with no knowledge of what has happened and is happening in the world cannot be an effective leader of youth.

In planning, the teacher must consider the types and amounts of subject matter with which children should come into contact in carrying on their studies. He must plan how to use this material

¹ For contrasting viewpoints see pp. 252-61 in *Curriculum Principles and Social Trends* by J. Minor Gwynn. Published by Macmillan Co., 1943.

and use it sensibly. In this connection he must understand that the approach to subject matter may be very different from the logical approach common in the older schools. He must know how children learn, and in planning must arrange procedures accordingly. The subject matter must be related to the children's experience; it must be simple enough for them to assimilate; it must be detailed and concrete rather than general and abstract; children must be introduced to it and taught how to assimilate it; and definite reasons for assimilation must be developed in order that they may be willing to try. Immature children must not be expected to master organized subject matter before they have had experience with it.

The value of organizing subject matter around real problems and questions can scarcely be denied. Someone has said that the one inherent trait that makes human beings educable is that of curiosity. To arouse curiosity is to go a long way toward success in teaching. The artistic teacher is a master in the art of questioning and of arousing interest through the provoking of curiosity. He plans for this and incorporates it in his plans. Subject matter can have little meaning for children except as it touches them in some vital way, enlightens their lives, and furthers their purposes. Forced feeding of subject matter is a profitless business.

Planning the Classroom Procedure. In making his plans, the teacher must look forward to the recitation or discussion period with an idea of making socialized contacts profitable. A discussion may be indicated in the plan and all necessary preparation made for it there. A common method of preparation for discussion is the writing of a few pivotal questions. It is of course difficult to prepare questions in advance because one never knows exactly what may happen. A good method is to outline questions or topics and have pupils prepare for them. This does not mean, however, the continuous use of long lists of fact questions as the sole day's assignment in history or geography, but rather the judicious use of pivotal questions among other aids to guide children's independent learning activities.

In any event some types of procedure must be in the teacher's mind. He may confidently look forward to the following:

- a. A question-and-answer recitation
- b. Informal discussion
- c. Individual reports

- d. Committee reports
- e. Incidental questioning
- f. A lecture or teaching period
- g. Demonstration
- h. Dramatization
- i. An illustrated talk
- j. A review or summary
- k. An oral test or examination

Any and all of these events will require knowledge of the proper procedure and planning for it. The success of the discussion will be assured if his plans have been carefully and skillfully laid.

In planning recitation procedure the teacher should look forward to having a variety of activities. The question-and-answer type of procedure becomes a deadly thing. Many types of procedure are appropriate and should be varied in accordance with the nature of the activity. The capacities of the pupils will determine how long and how detailed the recitation may be and what each individual may contribute. Many recitation periods may be teaching periods; others will be best used for summarization and review and the clearing up of doubtful points; still others will be largely devoted to reporting, discussion, and listening. Diagnostic and remedial work will sometimes be necessary as need for correcting errors appears in tests and in directed study. In planning for the various units it is advantageous to assign the probable amount of time which will be needed for assignment, study, recitation, and examination in order that teacher and pupils may hold themselves to some schedule and not waste time unnecessarily on any of these activities.

Checking the Effectiveness of Plans. The best test of the effectiveness of a plan is use, provided, of course, that the aims and purpose of the plan are educationally sound. If a plan works it is a good plan; if it has worked in the past this is the best assurance that it may work again. There is little probability that a young teacher will know whether a plan will work or not, but an experienced teacher may become a very good judge of the workability of a plan. Elsewhere one of the authors has published a check list for the unit plan which may be used by the reader in judging what a good plan of this kind should contain. There is also a set of standards which may be helpful.² See also the authors' *Directed*

² Yoakam, G. A. *The Improvement of the Assignment*. New York: Macmillan Co., 1932. Pp. 375-88.

Study and Observation of Teaching for outlines and guides for the study and evaluation of lesson plans.

STUDY QUESTIONS

1. What changes have been taking place in lesson-planning in recent years?
2. What are the prerequisites to successful lesson-planning?
3. What are the functions of the lesson plan?
4. What types of lesson plans are in common use?
5. What are the values and disadvantages of the commercial plan book?
6. What are the features of the daily lesson plan?
7. What are the features and values of the term outline?
8. What is a unit plan? Describe a typical unit plan.
9. What are the advantages of using the unit plan? The disadvantages?
10. What is a study guide?
11. What are duplicated exercises?
12. What is a workbook? Discuss its advantages and disadvantages.
13. What use may be made of hasty notes in lesson planning?
14. What are the features of a good lesson plan?
15. What subject matter does a good plan contain?
16. What provisions for recitation and discussion must be made in the plan?
17. How may the effectiveness of a plan be checked?
18. Discuss lesson-planning by the experienced as contrasted with the inexperienced teacher.

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Contains related exercises.

Although writers on techniques of teaching have given some attention to the assignment, until very recent times the importance of the techniques of this activity has not been fully realized. Interest in the direction of learning, however, has revived an interest in the assignment. Teachers are coming to realize that time and thought spent on planning and making the assignment are likely to affect profoundly the study habits of children and to result in economy in both learning and teaching. If good assignments are made, children can and will study independently with success; but if poor assignments are made, children will fail to profit by the time spent in independent or supervised study. This is true for all forms and types of teaching.

The Meaning of "Assignment." The assignment is the period in the teaching cycle when the teacher considers and outlines tentatively the activities of the pupils in preparation for study. The term is common not only in teaching but also in the legal and military world. Literally it means the giving out of a task or job by a person in authority. This meaning has prevailed in schools in the past, but a new meaning is gradually gaining use. The assignment in the new school may be a planning and organizing period. The teacher may not set any tasks. The children may propose and suggest the next things to be done and voluntarily undertake to do them. Little compulsion may be exerted by the teacher, but a great deal of suggestion and direction is sometimes necessary, and in the early stages of any learning is generally required. If children fail to work profitably the teacher is responsible; he must so manage

that they will undertake the work cheerfully and persist in their efforts to solve the problems, collect the material, prepare the reports, and do the practice, etc., that are necessary for successfully carrying on the activity.

The Traditional Assignment. The assignment originated in the traditional school in which often a great deal of lesson-hearing was done and very little teaching. Children were assigned impossible tasks and little thought was given to the problem of making it possible for them to perform the tasks. No thought was given to pupil participation in planning and little stimulation to thinking ever occurred. All that is changing, however. Hasty and careless assignments to which little thought is given are passing into limbo.

The Importance of the Assignment. The importance of the assignment as a technique of teaching is apparent when one realizes that children need direction in their activities. They cannot enter into a new field without guidance. The assignment gives them that guidance in an expert way, prevents failure, provides for the arousal of interest, and makes success reasonably sure. Independent study is not possible without good assignments. Within recent years much progress has been made in organizing new-type assignments—contracts, study guides, work sheets, workbooks, etc. These new forms of the assignment offer many advantages, and aid the teacher materially to improve his technique. If children are to work independently, they must be guided in such a skillful manner that independent work will result in progress and not in the learning of habits of dawdling and shirking. Children work cheerfully under the guidance of skillful teachers.

The Necessity of Training. Teachers cannot make progress in the assignment without adequate training. The preparation for this technique demands that they know their subject matter; have a broad understanding of children, their interests and their abilities to learn; be familiar with the materials of instruction available in the field of study concerned; know how to plan courses and direct activities through guidance; have a broad view of the curriculum in which the study lies; know how to test in order to discover what needs emphasis as well as what has been learned; and be expert in using recognized techniques which are most effective in making the assignment to children. This implies a considerable amount of professional training. As a matter of fact, no one can teach successfully without a reasonable familiarity with the principles of

the assignment as well as adequate background in subject matter and in the psychology of learning.

A Natural Procedure. The assignment is as necessary an activity in teaching and learning as discussion, testing, studying, practice, or any other form of activity. Those who feel that all the older techniques are obsolete or obsolescent are, in a manner of speaking, merely striking out against formalism in teaching in their efforts to dissuade teachers from assigning pages in textbooks and allowing children to flounder in the task of learning them for recitation. The authors are in complete sympathy with the desire to eliminate from the school the faults of the traditional procedure, but they do not believe that any good purpose is served by urging that such useful terms as "assignment," "study," "recitation," "examination," "practice," and "drill" be eliminated from the educational vocabulary. To be sure, the nature of the assignment is not the same as it once was; but this does not mean that there is not an activity in teaching and learning which may properly be called the assignment. The direction of learning activities naturally involves the assignment of duties.

Changing Ideas of the Assignment. Poor assignments never were characteristic of the good teacher; they are far less excusable now than in the past because experimental study and improvement of practice have pointed out new and better methods of directing the work of children. The assignment of today is more likely to be a cooperative activity and is carried on by means of discussion among the members of the class guided and helped by the teacher. Sometimes, when the situation is appropriate, it is guided by the use of prepared mimeographed or printed material in the form of practice exercises, problems, outlines of reference material, job sheets including blue prints of procedure, or other definite types of outlined work to be accomplished. This type of assignment is definite, clear, adjusted to the needs of the pupils, interesting, and effective. The modern teacher is prepared with many types of such material for profitable use by children.

The Necessity of Variety. Assignments vary with the nature of the work being done. Outlines and work sheets are appropriate for some types of assignments and inappropriate for others. Recreational activities do not often require as careful and detailed assignment as work activities. Assignments which are appropriate for socialized activities would often be inappropriate for individual

study or play. The assignment in an activity unit may be almost entirely a cooperative affair. In all cases, however, assignments should be definite and clear and should be possible of achievement; care should be taken to make them direct children to interesting and valuable experiences. Vagueness and indefiniteness are to be avoided in all kinds of assignments whether they are long or short, difficult or easy. Nothing discourages children quite so quickly as vague and indefinite assignments, unless it be assignments that are too long and unfair. The teacher who wishes to be successful in training children in the art of independent study will look to his assignments.

Probably the most interesting and provoking type of assignment is the problem type in which there is a problem to be solved or a difficulty to be overcome. Nevertheless, it is obvious that all kinds of assignments cannot be of the problem type. Often the teacher wishes the child to read a book for pleasure, to collect some information, to prepare a theme, to prepare a report, or to practice some needed exercises in order to memorize valuable information or to perfect some needed skill. In many of these types of assignment it is necessary that the child practice just as the golfer practices his swing or the marksman shoots at a target in order to gain skill. The proper procedure here is to be sure that the child sees the value of the practice or feels the need, and that the task is set up definitely, clearly, and effectively. Where study periods at school or at home can be arranged so that the child will pursue some problem with breathless interest, the situation is most promising. It is even probable that study assignments should be, in so far as possible, of this type; but it is likely that many of the more prosaic assignments will need to be made, even in the most modern school.

The Home Assignment. Assignments may easily be too difficult for the child. In such a case, when he is at home, he merely tries to get his parents to do the assignment, worries and frets about it, and perhaps ends in tears. For this reason it is questionable practice to give the child a home assignment on a complex problem, the learning of a new skill, or any particularly technical type of learning. Such work should be done under the eye of the teacher in a supervised learning period. Only among older children in high school or among college and university students is a complex assignment that requires great independence and ingenuity in devising ways and means or a highly developed power in independent thinking,

appropriate for home study; and even then such assignments should be approached gradually.

Necessity of Systematic Assignments. It is highly desirable that assignments grow out of the activities and interests of the pupil. Unless they do, the chances of effective independent work being done are small. There is no effort without interest, and without effort study is likely to be onerous and ineffective. Sometimes, however, with the very best efforts possible, the teacher is not successful in arousing the interests of children or at least in creating a situation where interests can arise. In that case, if the assignment is important and necessary for future progress, there is no other way except to make it as clear and definite as possible and require that the child do it. Situations of this sort often arise even in schools which are making every effort to discover better materials and methods of instruction and to make the curriculum more functional. When these difficulties do appear, the work must go on. If assignments are clear and definite and if children are able to make progress in mastering them, children are generally happy and derive satisfaction from the work.

Characteristics of the Good Assignment. It is obvious that in the preceding discussion important characteristics of a good assignment are implied. A good assignment has the following important characteristics:

1. It is definite.
2. It is clear.
3. It is related to the old.
4. It is interesting.
5. It directs the learning activity.
6. It takes into account previous learning.
7. It removes difficulties.
8. It recognizes individual differences.
9. It is stimulating.
10. It emphasizes essentials.
11. It is cooperative and emphasizes the "we" spirit.
12. It develops insight and understanding.

This list of essentials implies that the teacher has a command of the art of teaching and that he has prepared himself so thoroughly that when he makes an assignment, he does so with full knowledge of the problems of learning involved and of the abilities of the pupils with whom he is working. He is not hasty or careless; he realizes that it pays to make haste slowly in order that the children

may be ready to work successfully. With the skill of an artist in laying out his canvas, choosing his medium, and laying it on, the teacher manages subject matter and children so that out of the situation a profitable experience is gained. The good assignment is characteristic of the earnest, conscientious, well-prepared, and skilled teacher.

Objectives or Aims. The objectives of the teacher in the assignment are implied in the characteristics of a good assignment mentioned above. It is his purpose to arouse the children's interest, to stimulate thinking, to obtain their cooperation, to encourage initiative, to clear up misunderstanding, to strengthen morale, to develop insight and understanding, and to outline the work to be undertaken definitely enough so that the purpose is clear, but not so definitely that no difficulty will be met and no challenge experienced. He attempts to anticipate difficulties and to make it possible for the children to succeed in mastering them. All of these purposes are directed by the desire to have the children work or study profitably, grow in power, independence, and initiative, and enjoy a worthwhile experience.

The assignment has perhaps as its major aim the motivation of study, since teachers realize that study is most effective when it is highly motivated. The best type of motivation occurs when the work to be done is significant and meaningful for the learner. Unless instruction is supervised in person by the teacher (i.e., unless children never study except when the teacher is available for conference when needed) the child has no other aid in the performance of a study task except that given in the assignment. It is almost universally conceded that the assignment period should be used in part as a time for motivation.

The only way in which the teacher can be reasonably certain that some preparation of the assignment will take place is to exercise great care in making it so that it will be definite, interesting, and fair. If he does that, it is reasonable to expect some effort from each of the pupils. If he gets results without careful assignment, it is because children are often somewhat more conscientious and purposeful than their teacher.

Individual Differences. One of the aims of the assignment which has received marked attention in the past few years is the individualization of the work to be done. To this end the Dalton contract, the job sheet of industrial education, the guide sheet of the Morri-

son plan, workbooks, and outlines were devised. It is possible to provide in such assignments for individual rates of progress so that the bright are challenged and the backward are still enabled to make some progress. Sometimes the work for the different ability groups is laid out in levels so that each group knows what it is to do. In the Dalton plan pupils progress individually for a month through the contract without being held up by the backwardness of others. In any type of school, provisions for individual differences may be made by including required and optional work in the assignment or by making the assignment so flexible that there is opportunity for all.

Motivating the Assignment. Motivation is looked upon by some educationists as a device for the educator who realizes that the traditional subject matter of education is adult-like and not suited to children, and that if they are to learn it at all some extrinsic form of motivation is necessary to make it palatable. In this discussion we shall refer to motivation as the activity concerned with the setup of the situation for effective learning. It is hoped that there will be as little necessity as possible for extrinsic motivation, like using a language game, for instance, for the motivation of practice in correct forms of speech. It is rather the purpose of this section to suggest that in the approach to any learning situation, care must be taken to discern the elements in it that are intrinsically interesting and to take advantage of them to promote the learning. In the assignment, the teacher will make every effort to bring out all the interesting aspects of the subject, to suggest interesting types of activity, to make contacts with previous experiences, and to show how the proposed activity is an outgrowth of what has gone before. If this is done, the children will voluntarily undertake the assignment and profit by it. If, on the other hand, the problem is ignored, much wasted time and effort will follow.

The activities suggested by the assignment should by all means be childlike. They should be meaningful to the child. Those things which are likely to arouse the child to think, give him insight, and modify his ways of responding must be chosen and undertaken. This is simply another way of saying that the aspects of a subject which are not too complex for children to understand must be noted and chosen for activities in the assignment. Due consideration of the immediate interests of the children must naturally follow. Yet this does not mean that there shall be a foolish pandering

to the whims of children. Progress must be made. Guidance must be provided. The wisdom of the teacher must be exercised to prevent error. No one can know in advance all the aspects of the subject which may interest children; therefore, provisions for flexibility must be made. The assignment must be changed when it is advisable to change it and as far as possible the immediate interests of children should be followed, provided they are worth following. Of the latter the teacher must be the judge. It is generally agreed among authorities today that imposing remote interests or values upon children is a profitless business.

The Need for Challenge. The removal of difficulties likely to prove insurmountable by children is one of the functions of the assignment in good teaching. It is perplexing, of course, to judge whether a given assignment does or does not contain such difficulties; but the experience and training of the teacher should make him reasonably expert in determining when they are present. He must not, on the other hand, remove all the difficulties from the task. Enough must be left to constitute a real challenge to effort. Children like to do things that are arduous. They are often found struggling to climb a high fence, surmount a high wall, or solve a difficult puzzle. In doing these feats they will be the first to protest the officious help of a well-meaning but ignorant adult who does not understand that the victory is sweet when the fight is hard. In most cases it will be wise to provide a variety of challenges to meet the needs of children of different temperaments and varying backgrounds. It is seldom that a teaching situation will be equally interesting in all its aspects to all children who compose the group. Some children like to surmount walls but others would prefer to climb trees.

Types of Assignments. Assignments may be classified into two major types on a chronological basis: (1) old-type, or those which have been long in use; and (2) new-type, or those which have developed out of recent changes in education. When classified according to form, the old type includes page, paragraph, topic, theme, exercise, question, and experiment; the new type includes the project, unit, contract, activity, problem, and job. The older type is characteristic of the traditional school. The newer type is a development of the movement for directed study or directed learning.

It should be noted, however, that the most important distinction between old-type and new-type assignments is the fact that each is

based upon a different psychology and philosophy of education. The old-type assignment, which was given by the teacher without much consideration of the pupil, for the most part lacked interest, definiteness, clearness, stimulation, and direction. Exercises or problems in arithmetic, the preparation of a theme in English or the social studies, or the experimental activities in the laboratory were often good assignments and were well made. In general, however, old types of assignment were too brief and too indefinite to stir up interest and arouse pupils to effort, and they were based on an authoritarian view of teaching and learning.

The advantages of new-type assignments are inherent in their form and purpose. They are based upon a democratic theory of learning and teaching. For the most part they are an outgrowth of better lesson-planning and organization of the learning situation. They are unified, definite, clear, stimulating, directive, and challenging, and require the exercise of much more skill and more definite preparation on the part of the teacher than the older types. For examples of these types of assignments and a more complete discussion of their advantages and disadvantages, see the reference in the footnote on this page.¹

It is highly desirable that the teacher who wishes to be in touch with the most recent methods acquaint himself with the preparation and use of assignments of the newer types. While it is advantageous to use work sheets, guide sheets, outlines, and workbooks in connection with the newer types of assignment, it is by no means impossible to use them without mimeographed or printed materials. Teachers who study the printed examples of new-type contracts, units, etc., may derive much benefit from them without adopting any particular form or type completely.

Making the Assignment. Although materials for making the assignment may be prepared in written form, the assignment of work for study must also generally be accompanied with oral directions by the teacher. In any case the teacher needs to discuss and explain the task to be done. In using written assignment material it may sometimes be unnecessary to do more than indicate the portion of the written material to be studied, but the practice of omitting discussion is bad and leads to a lack of interest on the part of the children and failure to benefit from the better-organized material.

¹ Yoakam, G. A., *The Improvement of the Assignment*. New York: Macmillan Co., 1932. Chap. III, pp. 36-88.

In making the assignment, the teacher must avoid acting like a commander in charge of troops. He must rather regard the assignment period as a time for cooperative thinking and for suggestion. He should invite rather than command. His attitude will have a large influence on the attitude of the children. If he says, "Let us do this," instead of, "I want you to do that," he will have at least exhibited the spirit of cooperation and perhaps his pupils will catch the infection. The effects of his personality on the willingness of pupils to undertake an activity are bound to be very great. Therefore, it is well to assume the best possible attitude and to persist in the belief that children will be affected by it.

Steps in Assignment-Making. The assignment generally proceeds in a series of rather well-defined steps. These may be outlined as follows:

1. Reference to a previous experience
2. Discussion
3. Proposal of a new activity
4. Discussion leading to acceptance of the activity
5. Explanations and clearing up of difficulties
6. Outlining the materials to be used
7. Distributing the tasks to be done
8. Overseeing the beginning of the work, if possible

It is well to record the assignment either on the blackboard, in the children's notebooks, or in the form of a mimeographed guide sheet or outline. If it is recorded, it is less likely to be forgotten and the child may use the material as a guide in study. If there are no facilities for duplicating guide sheets, the blackboard is an ever-present help in making assignments definite. Children understand through the eye often when they do not understand through the ear. Systematic recording of the assignment pays.

Time Control. The assignment should be made at the most opportune time. Where the daily recitation is the rule, some writers favor the giving of the assignment at the beginning of the period. But if the assignment is to grow out of the day's experience, it is clear that it must be given at the end. The most effective assignments are given when the class arrives at a point where it is obvious that there is additional work to be done. There is no evidence that any set time is the best for the assignment, and much reason to suppose that the time may be varied. Nevertheless, this fact should not be taken as an excuse to be careless about the assignment and to arrive

at the end of the hour with no assignment made. Managing the time for the assignment demands careful thinking on the part of the teacher.

The Length of the Assignment. The length of the assignment varies with the age and maturity of children. Independent seatwork assignments of fifteen or twenty minutes in length are common in the primary school. Home assignments requiring all the way from thirty minutes to an hour and a half are not uncommon in the middle grades. This practice of assigning heavy loads of homework is rightly giving way to voluntary homework on problems appropriate for that purpose, and greater dependence is placed on directed study in school for the more difficult and technical tasks of the school. For every hour of classwork, the high schools often require an hour of preparation, and the colleges and universities are said to require no less than two.

The truth of the matter is that there is little knowledge or good judgment among teachers as to how long assignments should be. It is quite likely, however, that teachers in the upper grades, high schools, and colleges greatly overassign and cause a needless amount of dissatisfaction among pupils without marked success in causing them to study. Assignments should be reasonable in length. There should be some agreement among the different members of the staff of a school as to home assignments so that each teacher will not demand from the child so much homework that children in their teens will be spending five or six hours five nights of the week in burning the midnight oil.

The teacher will often be justified in taking the entire class period for making the assignment. This is particularly true when the unit plan is being used and a new unit is being undertaken. No definite rule can be set down as to how long a time the assignment shall take. It is better to say that it may take a little time (ten minutes perhaps) on some days and a long time on other days. At the beginning of a new subject or unit it is likely to consume a considerable share of class time.

Materials of the Assignment. The technique of the assignment involves skill in the handling of special materials, among which are the textbooks, special reference books, maps, charts, pictures, slides, guide sheets, workbooks, and practice materials. The choice of materials suited to the needs of the children is a very important matter and necessitates a broad familiarity with the materials of

the field of the subject matter, including pedagogical materials of various kinds. The teacher in training should come into contact with the very best of these types of material in the laboratory school and should study carefully current commercial materials. It is also important that he receive training in the preparation of teacher-made materials, since in many small schools and poorer districts there will be little, if any, commercial materials of the kind available. In addition to an interesting and well-arranged textbook, at least a few related reference books, as well as the usual dictionary and encyclopedia, are needed in order to enrich the subject. Pictures, charts, maps, slides, and other special materials are necessary to enliven the subject and make it concrete. Guide sheets, outlines, and syllabi are highly useful in directing the independent study of children, and when properly used aid tremendously in good assignments. Tests are necessary for ascertaining the individual needs of children. With all of these things the teacher must be familiar, and he must make use of them in making his assignments stimulating to the pupils.

Visual and Other Aids. The assignment, as a period of motivating, planning, and purposing, affords an opportunity for the teacher to stimulate interest through the judicious use of visual material. A clever teacher can often use the blackboard advantageously for this purpose. Outlining the subject, drawing quick sketches, making rough maps, diagrams, etc., help assure accuracy and are often very useful in the assignment. The teacher must learn how to use them to stimulate interest. Workbooks, guide sheets, and practice materials are advantageous and save the teacher much time in needless duplicating of materials. But probably the most effective devices of all are the original outlines, guide sheets, and practice exercises devised by the teacher to fit the needs of the group; for these are likely, in the hands of a good teacher, to be better adjusted to the needs of the group and to tie up the new problem more closely to the experience of the pupils.

Need for Familiarity with Materials. In making the assignment it is the duty of the teacher to be thoroughly familiar with the materials to be used in connection with the new activity, whatever they may be. He should be able to indicate the relative importance of the materials and how to use them. He should attempt to individualize instruction at this time by assigning certain duties to children of special abilities and should be as helpful as possible with-

out doing the work for the children. Care in handling the materials well in the assignment will prevent failure in the study period.

The Value of Duplicated Materials. The value of the hectograph, mimeograph, or other duplicating machines for the preparation of materials to be used in the assignment and study periods can scarcely be overestimated. Poor teacher-made materials are probably less effective than well-made commercial materials. There is, however, a freshness and genuineness about teacher-made materials that make them especially effective in the hands of a good teacher. Teachers who are permitted to exercise their ingenuity in the preparation of original seatwork exercises, guide sheets, outlines, tests, and other duplicated materials are enjoying the same opportunity of creative learning that is advocated today by progressive thinkers as so necessary for children. Nothing causes teachers to grow quite so much as opportunities to engage in curriculum-making and in the creation of new types of teaching materials. Such materials also have many advantages for children, making unnecessary a great deal of routine copying, and furnishing definite guides in learning which, in a measure, take the place of the teacher while he is busy instructing other groups of children. Practice materials of a well-organized type furnish opportunities for children to work on their own difficulties individually, to check their own results, and to know definitely whether or not they are making progress in learning.

Skillful use of these and other materials in the assignment goes a long way toward creating interest, defining the work to be done, preventing failure, and insuring progress. Effective independent study is greatly promoted by them. The wise use of a textbook, while a necessary part of the whole process of teaching, cannot be as effective as an enriched type of teaching in which various devices are present to guide the child in his use of the materials of instruction.

Evaluating the Assignment. The effectiveness of the assignment is measured, by and large, by the results of the independent work of the pupils. If children show in the recitation, discussion, and study periods that they are interested in the subject and that they have succeeded in making progress in learning, part of this can be attributed to the effectiveness of the assignment. The effect of the assignment alone; is, however, difficult to evaluate except by experimental procedure. A practical means of evaluating the effectiveness of the

assignment is for the teacher in retrospect to check over the activities of the assignment with a good check list. A detailed check list for the oral assignment can be found in *The Improvement of the Assignment*.² A similar list for checking guide sheets, unit plans, and contracts is also included there. Standards for evaluating both type of assignments are also suggested.

An objective observation exercise for evaluating assignments is given in the accompanying workbook, *Directed Study and Observation of Teaching*. An objective test of assimilation of the principles developed in this chapter is also to be found in the same workbook, Unit 5.³

STUDY QUESTIONS

1. What movement in education emphasizes the need for effective assignment technique?
2. What need of children makes the assignment important?
3. What changes in the meaning of the assignment have occurred in recent years?
4. Does the assignment necessarily involve compulsion?
5. What training is necessary in order that teachers may make good assignments?
6. What arguments for the abolition of assignments can you advance?
7. In what ways do assignments vary with the work being done?
8. What is probably the most interesting type of assignment?
9. Why should assignments grow out of the activities and interests of pupils?
10. What are the essential characteristics of a good assignment? Discuss each.
11. What are the objectives or aims of a good assignment?
12. Discuss the motivation of study through the assignment.
13. Enumerate the different types of assignments, old and new. Discuss the advantages and disadvantages of each.
14. Discuss the making of the assignment.
15. Enumerate the materials of the assignment and discuss the importance of skill in their use.
16. How may the assignment be evaluated?

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³ *Ibid.*, 1934 edition. (Revision in preparation.)

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13. YOAKAM, G. A. *The Improvement of the Assignment*. New York: Macmillan Co., 1932.
Contains a very comprehensive treatment of the assignment.

14. YOAKAM, G. A., AND SIMPSON, R. G. *Directed Study and Observation of Teaching*, Unit 5. New York: Macmillan Co., 1934. (Revision in preparation.)

Contains related exercises.

Chapter XIII QUESTIONING

Ability to ask questions has long been regarded as one of the chief qualifications for successful teaching. In the old school in which the teacher did little but hear lessons, to be able to question successfully was undoubtedly one of the most necessary arts. The question-and-answer method in the recitation of the old type was an almost universal method of teaching. Times have changed; methods of the recitation have been altered so that the old-time teacher would find himself in a strange world; but still teachers question and children answer. To be able to formulate stimulating questions and to answer the questions which children ask is necessary for successful conduct of certain types of teaching activities. Particularly in the preparation of unit plans, study guides, and work sheets, the teacher is required to formulate questions that will stimulate the child's curiosity and arouse his desire to learn. Questioning is one of the techniques of teaching which all teachers will do well to study.

Questions Defined and Classified. Previous writers on questioning have classified questions into two major types, "natural" and "formal." A natural question is one which is asked because the questioner wants to know the answer. Children's spontaneous questions are of this type. The formal question is the type asked by the teacher in his attempts to stimulate some type of response on the part of the pupil. Unfortunately most of the questions asked in the school have in the past been teachers' questions. Children's questions of the natural type have annoyed parents and teachers for

generations; yet the spontaneous questions of children are of great importance in indicating their interests and suggesting lines of inquiry of great timeliness for them. It is unfortunate that children are all too often put off with, "Don't ask so many questions." "Be still." "You will drive a person mad." It is significant that children of preschool and primary years are full of spontaneous questions, but that a few years later it is very difficult to get them to volunteer questions of any sort.

Investigations of Children's Questions. An investigation by Helseth¹ seems to suggest, however, that children in the upper grades can ask very interesting, meaningful, and thought-provoking questions when they have the opportunity. A later investigation by Gatto² of the questions asked by children in the classroom resulted in gathering 4,190 questions from 408 individual pupils and 20 case studies. The questions fell into 22 classes. Gatto's study reveals no lack of ability on the part of children, if given a chance, to raise questions of a great variety of types. Helseth found that children improved in asking questions when taught their proper use. Stevens³ noted that children's questions are a sign of interest and an indication of a desire for knowledge. Moore found that children can ask questions as well or better than those asked by teachers.⁴ These studies suggest that teachers may profit much from a study of the practices of children as well as from some investigation of the nature of questions and the art of questioning.

Characteristics of Good Questions. In the preceding discussion it was implied that questions are interrogative statements which stimulate the learner either to recall facts that are thought valuable or to search for the answer to questions or problems which he does not know. The formal question of the teacher is a means of stimulating the child's mental activities; the child's question is an indication of a need, doubt, or perplexity which has occurred in his thinking. It behooves the teacher, therefore, to know the characteristics of a good question, to take care in the formulation and asking

¹ Helseth, Olga, *Children's Thinking*. New York: Teachers College, Columbia University, Contributions to Education, No. 209, 1926.

² Gatto, F. M., *Pupils' Questions: Their Nature and Their Relationship to the Study Process*. Ph.D. Dissertation, University of Pittsburgh, 1929.

³ Stevens, Romiett, *The Question as a Measure of Efficiency in Instruction*. New York: Teachers College, Columbia University, 1912.

⁴ Moore, Nellie E., "An Analysis of Study Questions Found in Textbooks for Intermediate Grades," *Elementary School Journal*, Vol. 27 (1926), pp. 194-208.

of questions, and to study children's questions as indicative of their needs.

Characteristics of good questions are as follows:

1. *Clarity.* The question must be constructed in such a fashion that the child easily understands what is wanted even though he may not know the answer to the question. The same qualities that make a sentence clear make a question clear. For example, "Who is the king of England?" is a good question, but "Who is the king?" is a question that cannot be answered until the child knows what king is meant.

2. *Simplicity.* A question may be a good question for adults and a very poor question for children. "What is the nature of the theory of relativity?" is a perfectly good question for an advanced student of mathematics, but not a question a child can answer. The language of the child must be used in formulating questions. A teacher should carefully scan a proposed list of questions to see whether or not there are some unusual terms which may make it difficult or impossible for the child to answer.

3. *Challenge.* A good question stimulates the child to think, that is, to compare, evaluate, and draw inferences and conclusions. "What is the capital of the United States?" is a question of the fact type which makes no appeal to the child's ability to reason but simply requires him to exercise his memory. Such questions are appropriate for a quiz or review and only then as a part of a series of questions among which many are of the thought type. On the other hand, "Do you think Washington is well located to be the capital of the United States?" may stimulate the reasoning powers of the child and lead to further thinking.

4. *Specificity.* Questions should require specific rather than general answers. The child should not be encouraged by the teacher's questions to bluff and generalize without having some data on which to base his answer; nor should he be permitted to give vague and general answers to specific questions. "What are the universal characteristics of scholarly men everywhere?" may be a poor question for children because they do not have sufficient experience to generalize. But "What birds have you observed in the last week?" may be properly put because the child has sufficient information available to make his answer specific and exact. Yet the child should be taught to generalize from specific data. Such questions as, "From what you have seen of the robin, do you think he is a good father?"

Why?" are entirely within the child's power to answer. Generalizations appropriate to the child's experience should be encouraged.

5. *Definiteness*. The question must be so stated that it permits one answer only. "Who was Washington and what did he do at Valley Forge?" is a poor question, or rather two questions put as one. It cannot be answered by the child without a mental readjustment during the process of answering. "Who are the people of Mars?" is a poor question because it is impossible for anyone to answer it definitely. "Of what race or races are the people of England?" is a definite question and may be precisely answered. Likewise, "What do you think makes England such a great seafaring nation?" is a good thought-provoking question which a child should be able to answer.

To embody this list of characteristics in any list of questions will challenge the ingenuity of the teacher, but trying to do this is worthwhile.

It is implied in the foregoing that questions should be adapted to the maturity of the learners and that they should be interesting, challenging, and thought-provoking rather than of a purely routine character. They should also suggest the limits of the task which the learner is expected to accomplish. The latter requirement is particularly true of questions given for guidance in study and of review questions or questions of assimilation, because the child takes his cue from what is asked and is likely to feel that the questions indicate the relative importance of the ideas under consideration. Questions should usually be simpler than the language used in the textbook. The teacher should interpret the textbook for the pupils if it is difficult for them, but if the material is suitable for the child he should be encouraged to make his own interpretation. At times, the teacher and children may properly work together in interpreting printed material. Questions should often require comparison and evaluation and should compel the child to reorganize his ideas before he is prepared to answer. Organization and thought are often excluded in teachers' questions because such questions are hard to make; it is far easier simply to ask, "Where was Valley Forge?" than to ask, "What is the significance of Valley Forge in American history?" The latter question requires a larger view of the subject.

Problem or thought questions are particularly valuable in teaching because they are stimulating to the child's powers of thought.

"What was the greatest contribution made by Washington to the American people?" may offer a great challenge to a group of children, whereas, "On what date did Yorktown fall?" has little challenge because it may be answered with a minimum of thinking. Problem questions raised by the pupils which represent real gaps in their field of knowledge are very stimulating motivators of mental activity. Teachers should be constantly on the lookout for the most stimulating questions they can find.

It is a good practice for the teacher to try to answer his own questions before directing them at children, for he may find that he has been obscure in the statement of some of them, that his own thought was not clear when the question was formulated, and that he can improve the form and content of questions through reflection.

Questions should conform to the immediate objectives of the teacher. It is obviously foolish to ask a series of questions which bear little relation to the objectives. Such questions will lead the pupils astray and result in the loss of time and effort.

The Purpose or Function of Questions. The fundamental purpose of questions is to stimulate children to think. The teacher often uses them for another purpose almost entirely; namely, to find out how well the child has remembered what he has been told or has studied. The latter purpose of questioning is not the major or most important purpose, but it is legitimate when used properly.

Questioning can reveal to the teacher the mental processes of the pupil, the range and breadth of his knowledge. Questioning may reveal lack of assimilation by the child of even the basic information necessary in thinking about a subject or inconsistencies in his thinking about it, and indicate to the teacher what remains to be done in order that the child may think more adequately.

By questioning, the teacher may find that pupils are poor readers, careless in the interpretation of questions, lacking in vocabulary, unable to locate information, inferior in organizing ideas independently, weak in comparison, evaluation, and judgment. Doubtless the teacher can find these things out more readily through a well-organized written test, but even oral questioning can reveal a good deal concerning the pupil's mental processes.

The Value of Questions in Study. Questions may be used to emphasize the facts that children should learn. Many teachers make much use of study questions in assigning lessons. Unit plans, workbooks,

and study guides make prolific use of questions of various types for the purpose of indicating the important divisions of the subject. For instance the following questions indicate the important aspects of the subject, "Balloons."

1. What is a balloon?
2. Where did balloons originate?
3. How many different kinds of balloons are there?
4. What are the most important features of each kind of balloon?
5. What are the important uses to which balloons are put?
6. What is the probable future of the balloon?

Finding the answers to these questions would constitute a fairly comprehensive study of the balloon and would tend to help the child locate information, assimilate, compare, evaluate, and come to conclusions about balloons.

Other Uses of Questions. Even a few random questions by the teacher, if cleverly put, will reveal what children are interested in. A little care to encourage children to raise questions that perplex them and some systematic recording of questions which children ask will soon reveal to the teacher the nature of their interests and problems. Questions reveal interest and interests are important factors in learning.

The organization of materials may be directed by a series of questions as indicated in the example above of balloons. The teacher might indicate the same organization by an outline, but there is something much more stimulating about a list of questions. Any type of organization may be directed in this manner. Such direction is helpful to children when they are beginning to learn how to study or when they are first encountering a new field. Problem questions are stimulating and thought-provoking.

It has long been noted that in those subjects in which definite problems and questions were assigned to children for mastery, greater effort was made by pupils to do the work. The reason for this is that immature minds like to have definite objectives. Many teachers are now using problem as well as fact questions in directing the study of the school subjects with good effect. If the questions are well chosen and stimulating, this method is an undoubted aid to children in their attempts to assimilate new material.

Questions have been used for review purposes for centuries. In the learning of the so-called catechetical types, this was the sole type of exercise used in order to teach children certain facts. The

method would hardly be acceptable today. But if the teacher will mix in with questions of fact, questions of judgment, interpretation, and appreciation, it may still be used as a means of summary, review, and preparation for tests of assimilation.

Questions may also be used for drill purposes. In this type of exercise, they should be organized in order from the simple to the complex. It is doubtful that they should follow the chronological order of the material. Some think that they should be in a mixed order so that the child will be required to think rather than to memorize. Topical rather than detailed questions may be used to advantage in order to improve the child's power to organize what he knows.

The advantage of measuring progress by questioning, rather than by objective tests of the multiple-choice or other objective types, is that verbal and written answers to questions force the child to organize his ideas and give him practice in expression which is undoubtedly very valuable. However, children with limited powers of expression sometimes make better scores on objective tests than on tests of the essay or written-answer type.

Questioning as a means of getting an understanding of the materials should be used both by the teacher and by the pupil in class and study exercises. The teacher's questions will bring out the points that the child has overlooked; the child's own questions, raised as he studies the material, will reveal to him interesting points to consider and additional reading to be done.

Pupils should be encouraged to ask thought questions as well as to ask fact questions. Unfortunately, many of their questions do not reveal a great deal of mental effort. This may well be because teachers do not ask a larger number of thought-provoking questions and thus fail to set a proper example. This failure of children to ask thought questions is revealed in a study⁵ in which a sampling of 200 questions asked by seventh-grade pupils was analyzed for indications of thinking. In consideration of the results of this investigation, one may expect that seventh-grade pupils will ask approximately one thought question in every six questions, or about 17 per cent. Furthermore, this same study reveals no significant relationship between thought implications of pupils' questions

⁵ Corey, Stephen M.; Fahey, George L., "Inferring Type of Pupils' Mental Activity from Classroom Questions Asked," *Journal of Educational Psychology*, Vol. 31 (Feb., 1940), pp. 94-102.

and such factors as intelligence, scholastic standing, grade in the course, etc.

Types of Questions. Questions may be roughly classified from one point of view as fact and interpretational (thought) questions, and from another as memory and recognition questions. A fact question calls for the ability to answer in terms of data already in existence, which may be known or unknown. "What is the largest wheat-producing region in the world?" is a definite fact question. An interpretational question, on the other hand, requires the student to draw an inference from data which are known but which cannot yield the answer to the question without interpretation. "Why do you like this story?" is a question which requires thought and interpretation on the part of the pupil, while "Do you like this story?" is a mere question of fact and can be answered without thought. Memory questions are those which must be answered with reference to something that has been learned in past time. Recognition questions are those which can be answered by observation or examination of data by the student without reference to memory. The latter might be called questions of comprehension.

Gatto's Classification. There are undoubtedly many ways in which questions may be classified. Previous writers have made the attempt to do this. The authors will take advantage of a classification worked out by Gatto⁶ after he had examined the previous classifications of others:

1. Memory: "Where is Duluth?"
2. Organization: "How did people in Colonial days travel?"
3. Causal reasoning: "Why is a blast furnace never allowed to get cold?"
4. Evaluation: "Is it a true story?"
5. Inference: "Would you like to go to Florida in winter?"
6. Information (problem): "What makes leaves green?"
7. Comparison: "Which was the greater man, Washington or Jefferson?"
8. Analysis: "What makes this flower beautiful?"
9. Interpretation: "What does census mean?"

The above classification is based upon the analysis of the mental function involved in answering the question. In Gatto's complete classification of questions, finer differences are drawn than in the above. The nine types above seem, however, to be sufficiently fine for practical use. It should be noted that if the textbook or the teacher has previously given the answer to any of the type questions

⁶ Gatto, F. M., *Pupils' Questions: Their Nature and Their Relationship to the Study Process*. Ph.D. Dissertation, University of Pittsburgh, 1929.

listed here, they then become fact questions and do not require reorganization of thought to answer.

Current criticism of teachers' questions bewails the fact that they so often demand mere memory of words for their answer and that they do not require the pupil to think in order to answer them. Writers on questioning have been unanimous in their insistence that the main purpose of asking questions is to stimulate the thought process. If teachers would make some study of the nature of questions, such as is implied in the classification given here, they would improve in the art of questioning. When writing a list of questions, the teacher should check through the list to see how many kinds of thoughtful reaction he is likely to elicit from pupils.

Questions may also be spoken of as detailed questions or topical questions. A detailed question asks for a simple fact, "What happened on July 4, 1776?" The topical question, as for instance, "What were the causes of the American Revolution?" asks for a connected statement. The only difference is that one requires a single statement for the answer while the other requires a discussion of a topic.

An Error Classification. Questions are further discussed and classified in accordance with the errors made by the teacher in using them. The leading question is one commonly misused by teachers. "George Washington was better known for his character than for his military genius, was he not?" is a leading question because the child gets a key to the answer from the question. Another type of poor question is the pumping question: "Who was Columbus? What did he do? When did he do it? Why? What were the results?" The teacher fires at will and the pupils respond in one-word answers. A third type of bad question is the double question: "Who was Washington and why was he famous? One at a time, please." Another poor question is the direct question: "Was George Washington well known for his military genius?" The alternative question is another bad type: "What or who was the cause of the Thirty Years' War?" Nobody could answer until he knew "what" or "who." Faulty questioning on the part of the teacher is generally due to haste, to unfamiliarity with the subject, or to muddled thinking. One cannot ask good questions without clear thinking. Even one who knows that he does not know is in a position to ask a good question; but when he doesn't even realize his own ignorance, pity the poor questionee.

Classification According to Teaching Function. Questions have been classified by others in accordance with their teaching function:

1. Drill questions
2. Review questions
3. Developmental questions
4. Examination questions

This classification will scarcely add anything to the discussion of types of questions because the functional analysis preceding is more basic. Drill, review, developmental, and examination questions will obviously be made up of the types previously discussed.

Technique or Procedure in Questioning. This may be divided into two parts.

1. *Asking Questions.* Good technique in questioning involves asking a sufficient number of questions so that pupils will be stimulated to activity, but not a barrage of questions which require a minimum of thought and the giving of short or one-word answers. Too many questions lead to too much teacher activity and not enough activity on the part of the pupil. The needless repetition of questions is another fault to be avoided, as is the giving of a question, giving the pupil's name, and then immediately afterward a repetition of the same question. In the latter case the child whose name is called is likely to think of the answer while other pupils take time out for rest. Another bad practice is to have a fixed or set order of giving out questions to the class, such as proceeding alphabetically or row by row. Ideally, all children in the class should participate in the discussion and such practices discourage a socialized response.

Questions should be asked in a pleasant manner, not too hurriedly and not in a fashion likely to create a nervous tension in the pupil and block his thinking. Nervous haste on the part of the teacher will encourage the same attitude among the pupils and disconcert them. Firing many short questions at children and attempting to pump out of them the answers to questions which they do not know is an equally bad practice.

The distribution of questions in such a manner that the majority of the pupils in a class will respond or take part in a discussion is another technique which the teacher must study. Bad practices are calling on the bright pupils at the expense of other members of the group, calling only on those who raise their hands, calling in a fixed order, calling exclusively on the inattentive pupils or

the dull ones. The chief fault in all these methods is that only part of the pupils share in the group thinking at any given time.

2. *Treating the Pupils' Answers.* Quite as important as the asking of questions is the manner in which the teacher accepts the answers of the pupils. In the first place, answers cannot be adequate if the questions are framed in such a way that they are not clear and understandable. Often when pupils fail to answer adequately, the fault lies in the teacher's question. Either the question itself may be incoherent, or he may be asking for conclusions that children should not or cannot reason out for themselves. Always to take the point of view that not knowing the answer is the cause of their failure is dangerous because it leads to unfairness and to failure on the teacher's part to improve his questioning.

Faults in the children's answers which are quite common are brief and incomplete answers, "yes" and "no" answers, pure guesses, and wrong answers due to lack of information or inability to reason. The answer is an indication of the pupil's progress or lack of it and of his ability to think. Only occasionally is the answer a willfully inaccurate and deliberately faulty one. It is far safer to assume that faulty answers are indicative of the need for remedial teaching than to assume the opposite. The teacher, because of his familiarity with them, should know in a general way just what is the cause of the pupils' failure. He should have some idea as to the nature and extent of their knowledge and of their ability to think. If a child is hasty, careless, lacks industry or ability, the teacher may frame his questions in such a way as to take these factors into account and thus do much to insure better answers. He may discourage guessing at the answer by emphasizing the need for accurate information and by so framing the question that guessing is difficult. The teacher who makes much use of the direct question and the alternative question encourages guessing. The one who uses questions which can be answered only in terms of known data or interpretation of known data will improve the child's ability to think.

When a question has been asked, time should be given to the group to think and formulate the answer and then some pupil may be asked to answer the question. When the child has answered, the teacher should refrain from repeating the pupil's answer. This is a nervous, time-consuming habit. While the child is answering, the teacher should refrain from unduly prompting him because inter-

fering with his answer interferes with his thought and prevents him from working out the answer. When a pupil has given the answer as best he can, the teacher should refrain from making sarcastic comments, reprimanding him, and in other ways treating his answer disrespectfully. If the child is a bluffer, the teacher may show him up by asking the question over again of some other child, or by reprimanding him in a kindly way for his attempt to evade the issue put to him by the question. The practice of bullying, in general, discourages children who may be timid and often merely amuses the lazy bright child without bringing about a reform. If the child is ignorant but has done the best he can, it is unfair and unkind to make a spectacle of him. In handling the answers of pupils, the teacher must make every effort to be fair in order that the pupils will feel free to respond and will be encouraged rather than dejected by the teacher's comments. A lack of sympathy for children is inexcusable in the teacher.

Outcomes of Questioning. The outcomes of a period in which the teacher has asked questions of the pupils may be stated briefly as follows:

1. The limitations of their knowledge and of their ability to reason should have been discovered.
2. The need for new knowledge, for more thinking, should have been established, or progress should have been made toward this end.
3. New interest and new curiosities should have become apparent.
4. Errors in knowledge and in thinking should have been cleared up.
5. Opportunities for the statement of questions which have arisen in the minds of the pupils should have occurred.
6. A good deal of reorganization in the knowledge of the pupils and in their thinking should have taken place.
7. Considerable connected talking should have been done by the pupils; complete rather than fragmentary answers should have been the rule.
8. Important points and essential conclusions should have been emphasized.
9. Improvement in the attitude of the pupils toward the subject should be apparent.
10. Some information with respect to the study habits and abilities of the pupils may have been gained, not every day, but often.
11. The extent and the character of the pupil's preparation for the discussion should have been ascertained.
12. Definite impressions of what the important aspects of the subject are should have been gained by the pupils.
13. Definite impressions of the progress or lack of progress made by the pupils should be gained by the teacher.

Each discussion, review, or test period in which questioning has been the principal technique employed by the teacher should have left each pupil with the sense that definite progress in the mastery of ideas and the clarification of thought has been made.

STUDY QUESTIONS

1. What is the importance of the question as a means of stimulating the mental activity of children?
2. What is the importance of spontaneous questions of children in teaching?
3. How much has been done to classify questions properly?
4. Enumerate the characteristics of good questions.
5. Why have problem questions come into such general use?
6. What functions can questions perform in the act of teaching?
7. Discuss the use of questions in guiding study activities.
8. What is the value of questions as a measure of progress in learning?
9. Compare oral questioning with written objective examination as a means of testing progress. What are the advantages of each?
10. Check the memory questions in this list of study questions. Which predominate, memory or thought questions?
11. Try to identify questions of the following types: fact, organization, causal reasoning, evaluation, inference, comparison, analysis, interpretation.
12. Are the questions in this list pure types? Indicate the reasons for your answer.
13. Enumerate the chief faults of teachers in questioning. Do the same for children's answers.
14. Discuss the desirability of being sympathetic with the answers of children.
15. What are the chief outcomes of questioning?
16. How may the effects of good questioning be measured by the teacher?

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Chapter XIV DIRECTING CHILDREN'S STUDY ACTIVITIES

Within the past two decades students of the art of teaching have learned that a new responsibility has been added to it. Instead of merely assigning lessons to children, letting them struggle with the assignment for an hour or two, and then calling them together for an oral quiz to find out what they have learned by their own efforts, the teacher must accept responsibility for stimulating their interests and guiding their activities during the study period. He must supervise or direct their study and he must take precautions so that, when they study, they have a reasonable chance to succeed at the task, if not immediately, then eventually. Directing study is a new and interesting challenge to teachers that must be met effectively.

Directing Study Explained. Not only is directed study poorly understood by a large number of teachers, but even study itself is a term which is rather loosely used. McMurry¹ wrote many years ago that study included all the aspects of an act of thinking. He analyzed it and enumerated the factors involved in it. Yoakam² summarized what previous writers had written on the nature of study, and found that it is a purposeful mental activity of the work type. It may include observation, practice or drill, associative learning, and problem-solving. In ordinary usage it involves all the purposeful work activities of the school which a child does by himself,

¹ McMurry, F. M., *How to Study and Teaching How to Study*. Boston: Houghton Mifflin Co., 1908. Pp. 12-27.

² Yoakam, G. A., *Reading and Study*. New York: Macmillan Co., 1928. Pp. 77-111.

either in or out of school. Real study is, however, problem-solving or reflective thinking, in the opinion of many. Perhaps it is more accurate to say that study is of different degrees of complexity, paralleling in this respect all mental activity. The highest type of study is that in which reflective thinking is involved. In schools of an earlier day, great emphasis was placed on memorizing as the chief act of study. Teachers and children still think of study largely as reading and memorizing.

Supervised Study, Directed Study, and Directing Learning. For a long time, the independent study of children was undirected and went on as a type of trial-and-error learning. Then about two decades ago an interest in directing the study of pupils arose. *Supervised study* was for a time heralded as a new type of teaching calculated to reform the study methods of children. *Directed study* and *directing learning* succeeded supervised study as a more basic attack upon the problem; for supervised study was, in effect, an administrative scheme for dividing the school day into study and recitation periods under the direction of the teacher, and it soon became apparent that directing study involved an understanding on the part of the teacher of the whole learning process as well as the knowledge of his subject which had previously been assumed.

Formerly, teachers conducted study without knowing too much about it. They apparently gave little consideration to the problem of having pupils report on their study habits. Lately, however, teachers have become vitally interested in obtaining the pupils' point of view of study activities. They have made inquiry of the methods which children most frequently employ in studying their lessons. In this connection one investigator,³ after analyzing a check list of grade and high school pupils' methods of study, found that the more intelligent children did not always use the study methods which experts recognize as the best. Cuff found that the dull pupils more often than the bright looked up words in the dictionary, and that the bright did not always recite silently immediately after reading their lessons.

The following table contains the ten methods of study which differentiate the abler pupils from the less able, according to Cuff. The list will bear most careful inspection and study.

³ Cuff, Noel B., "Study Habits in Grades Four to Twelve," *Journal of Educational Psychology*, Vol. 28 (1937), pp. 295-301. Used by permission of the author.

Table 4. The Ten Most Important Methods Which Are More Often Used by Good Students in Study Than by Poor Students

COM- POSITE RANK	QUESTIONS	ANS. BY GOOD MORE OFTEN THAN BY POOR STUDENTS
1	Have you a clear notion of the task before beginning the work of a particular study period?	YES
2	Do you make complete sentences while writing?	YES
3	Do you seek to master all the material as progress is made from lesson to lesson?	YES
4	Do you grasp the meaning of a chart or table without difficulty?	YES
5	Do you try to interrupt work at a natural break in the printed material, such as at the end of a chapter?	YES
6	Do you take notes while reading or studying?	NO
7	Do you work out individual examples to illustrate rules and principles?	YES
8	Do you provide yourself with materials required?	YES
9	Do you use facts learned in one class to aid in preparing for another?	YES
10	Do you read each topic in a lesson separately until it is understood?	YES

According to the data of the table, the bright pupils have a better command of efficient ways of studying their lessons than the dull pupils have. This is to be expected, since the abler pupils can do their work with a minimum of guidance from teachers. It is not to be inferred that good study habits are to be ignored by good students, for no one knows how much better good students may actually work if they have better study habits.⁴

The outcome of many investigations similar to this one led to improved ways of organizing plans for directing children's study.

Organized Plans for Directing Study. During recent years, many experiments in directing study have been carried on. The Dalton Plan with its contract and the Morrison Plan with its study guide and unit plans are perhaps the most famous of these. Winnetka, with a scheme for individualizing instruction, has been scarcely less influential. Out of all these experiments has emerged better understanding of what is involved in directing the learning of

⁴Brooks, Fowler D., and Heston, Joseph C., "The Validity of Items in a Study Habits Inventory," *Journal of Educational Psychology*, Vol. 36 (1945), pp. 257-70.

children. It is now recognized that it is probably more important to teach a child how to work than it is to teach him facts. Certainly attitudes and appreciations are as important, if not more important, than isolated facts, and skills without attitudes and appreciations are of doubtful worth in developing the individual.

A Plan for Study. A plan of study usually involves a unit of subject matter or an activity in which a systematic method of attack is required to complete it successfully. The following plan is suggestive of things which the students may do in studying textbooks.

Since efficient study originates from problems or questions to which the student demands answers, the initial step in studying a subject-matter unit or chapter is to find out what questions are raised or answered by it. To begin the study of a unit, formulate your questions.

1. *Read the Headings.* Give a minute's thought to the title of the chapter. What does it mean to you? Look at all of the section and paragraph headings. How do the topics or problems follow one another? What are their relationships?

2. *Skim the Chapter.* When looking at the headings, read a sentence or paragraph here and there, not to master the contents, but to see what puzzles you.

3. *Use the Questions, if Any, Which the Chapter Seeks to Answer.* Reframe some of the questions in your own words. Look up in a dictionary any words used in the questions that you do not understand.

4. *Study Large Units.* Study a comprehensive unit of subject matter in order to grasp the relationships between the parts of it. The smallest textbook unit recommended for study is a section, divided in your text by a centered heading. A paragraph is too small a unit, for if each paragraph is mastered by itself the connected sequence of the material may be lost. In the first intensive study, therefore, an entire section should be read. In restudy, after the basic relationships have been established, smaller units that cause special difficulties may receive individual attention.

5. *Read Actively.* Reading words, one after another, does not necessarily result in understanding or remembering. Each section must be read actively, using as many different kinds of activities and exercises as can be devised. Get the topic of each paragraph from its first sentence. Formulate some questions that the paragraph answers. Answer these questions in your own words.

6. *Recite to Yourself.* It is profitable to spend from 60 to 80 per cent of one's time in self-recitation. After reading a unit of material, look away from the book and repeat it in your own words. Then look at the book again to verify the correctness of what you have said.

7. *Study the Figures and Illustrations.* The figures and illustrations are an important part of a textbook. For each figure or chart ask: What does this figure or chart show? What conclusions can be drawn from it? How does it relate to the verbal description in the text? Answer these questions in your own words.

8. *Build Your Vocabulary.* The technical terms of any science are its tools of thought. During study, look up unfamiliar words in the glossary, locate them in the text by the aid of the index, or use a dictionary. Learn to pronounce the terms, for then they will be more useful to you.

9. *Do Not Memorize by Rote.* To remember the words of a textbook without a full understanding of their meaning is highly impracticable. It is far more valuable to be able to state an idea two or three different ways in your own words. The objection to memorizing is not directed against remembering, but against a lack of real comprehension. Material that is not understood well is retained poorly, and cannot be applied to new uses.

10. *Use Other Aids to Active Study.* In addition to self-recitation and the use of the study exercises, other aids to active study may be used. To *outline the chapter* is of some value if it is done thoughtfully, not by mechanically copying headings from the book. *Underline significant words and phrases* in the text to give them emphasis and to assist in reviewing. Another useful device is to *write statements* on the important topics of the chapter.

11. *Test Yourself After Studying.* After you believe that you have completed the study unit, test your knowledge. Either formulate questions about the material or answer questions which have been organized in connection with the unit. Self-testing is not the termination of study, however, unless you make an almost perfect showing. It is a diagnosis of your weak points, and a guide to further mastery.

The Peculiar Task of the School. The elementary school has for its peculiar task the development of the fundamental skills of reading, writing, and arithmetic. It is also necessary that children come into contact with geography, history, science, health, and

music, and that they develop fundamental attitudes toward and interests in social activities, as well as enjoyment and appreciation of literature, the fine arts, and handicrafts. In order to enjoy the benefits to be derived from these various kinds of experiences, they must grow in power to observe, read, communicate with others, and to think about and interpret meanings as well as to learn how to find the answers to new problems as they arise. Teaching how to study, then, involves teaching the child how to do mental work. The elementary school must lay an adequate foundation in the skills, and give the child a rich opportunity to develop ability to investigate new fields in a changing world. The secondary school builds upon this foundation by enlarging the experience of children in a broad way and by giving them an introduction into the fields of higher mathematics, science, economics, and the like, thus widening and enriching their contacts with the leisure and vocational activities of the world.

What Teaching to Study Involves. Teaching the child how to study involves, then, developing attitudes, information, skills, and habits of a more or less general character as well as teaching children how to think and work in the various fields of human thought. It consists of building systematic work habits involving the ability to observe, read, remember, and to think about and use the ideas that have been learned. Reading, thinking, writing, talking, using ideas, and planning activities of a constructive nature are involved in teaching how to study. All subjects and all activities furnish opportunities for teaching the child to study. Study may take place in the presence and under the immediate direction of the teacher, or it may be independent mental work. It is the common opinion today that it is the purpose of the school to make the child independent of his teachers and thus equip him with the ability to read, think, and act for himself. Looked at from this point of view, teaching a child how to study is the culmination of all the efforts of the teacher because in doing this he will help develop admirable traits of character: independence, initiative, judgment, dependability, perseverance; attitudes and interests of a permanent sort in worthwhile things of life; a broad experience in literature, social studies, science, etc.; abilities or skills in reading, observing, the use of figures, communication, and thinking; and fundamental habits of mental work which will serve the individual well in whatever kind of life he may be called upon to live.

Specific Objectives. As was indicated in the previous section, the general aim or objective of the teacher in teaching the child to study is to enable him to work independently. In accomplishing this major purpose he is definitely trying to develop certain specific attitudes, types of information, skills, and habits that are necessary in effective mental work. These are very complex but among the most important are the following:

1. *Attitudes and Interests*
 - a. Liking for study activities
 - b. Interest in a particular field of activity
2. *Information*
 - a. How to carry on study effectively
 - b. How to locate and use study materials
 - c. How to improve ability to study
 - d. Familiarity with a given field of study
3. *Skills or Abilities*
 - a. Ability to read informational material quickly and accurately
 - b. Ability to observe, listen, and gain experience directly
 - c. Ability to communicate ideas in talking and writing
 - d. Ability to think, associate ideas, compare, evaluate, infer, draw conclusions, and apply them to new situations
 - e. Ability to engage in constructive or creative activities, to plan, organize, execute, and carry out new projects of varied kinds
4. *Habits*
 - a. The habit of work
 - b. Thoughtfulness
 - c. The reading habit
 - d. Social cooperation
 - e. Worthy use of leisure time

These attitudes, types of information, abilities; and habits constitute the specific objectives of the teacher in teaching how to study. They are the desired outcomes. In achieving these outcomes experiences of various kinds are employed. The child should enjoy, in ever-broadening circles, rich contacts with all types of human achievement—literature, art, music, history, science, the whole gamut of human life—in so far as it is possible for him to do so in his stage of development.

The elementary school teacher must not lose sight of these larger aims in his preoccupation with the skills. He must not only teach the child to read, write, and manipulate numbers, but he must teach him to do these things for definite purposes. Likewise, he

must purposefully develop the abilities that are essential in successful study. These abilities will be constantly used by the child in any type of mental work he may undertake.

The Use of Subject Matter in Directed Study. The use of subject matter in teaching children how to study is as inevitable as the use of paint in the creation of a picture. Subject matter is experience. Some teachers regard subject matter as consisting of the organized experience of the race as found in books; others insist that subject matter is any kind of experience that may be used in the education of the child. The subject of history as organized in textbooks is one kind of subject matter; but the experience of children in the study of history constitutes the subject matter of that subject also. To limit the child's subject matter to books alone is obviously impossible; yet it is necessary to think of subject matter as organized bodies of information such as are found in history, geography, arithmetic, and the like. The teacher is confronted with the problem of how to use these bodies of organized information in teaching the child how to study.

Directing the Study of History.⁵ Not only must the child learn the subject matter of history; he must learn how to read and study the material of history. Textbooks in history constitute an outline of the subject. Merely to read and memorize these outlines will not teach the child how to study the subject. He must learn how to read, organize, assimilate, and use this body of material in getting a better understanding of life, and in the process he should come to have a permanent interest in the reading or study of history and to have his life made better for it. It is precisely this matter of teaching him to read, assimilate, organize, and use historical subject matter that is fundamental to success in teaching the child to study and enjoy history.

Now it is obvious that teaching the child to read in a general way involving some contact with history, may give him an introduction to the study of the subject; but if he does not become a student of history without any direct attempt on the part of the teacher of history to increase his ability to study history profitably, it will be a matter of transfer of training rather than a specific attempt on the part of the teacher to improve the pupil's methods of study. It is becoming increasingly clear that the teacher of a

⁵ See also Reeder, Edwin, "Directing Children's Study of Geography," *Educational Method*, Vol. 17 (1938), p. 387.

subject must not only teach the subject matter of that subject, but he must teach the child how to study the subject as well.

Theoretically, a child may be taught to study through the use of specially selected materials included in a basic or work-type reader. The material used is commonly taken from history, geography, and science. While reading this material the child is taught to comprehend, organize, and remember the important facts similar to those found in history, geography, and elementary science. This is a very worthwhile procedure, but it does not provide for transfer to the actual study of history, or other subject matter. As indicated above, the teacher of history must assume the responsibility for teaching the child to read and study history as he grows in maturity. Diagnostic and remedial work will be constantly necessary. It is dangerous for the teacher of history to take it for granted that the child can study the subject effectively without his continuous help and direction.

The Use of Factual Material. The type of material most necessary in teaching the child to study is factual or informational material. If materials of this sort have been written by a great literary artist so much the better. Children's books of an informational character must, however, be written by the current generation of historians, geographers, and scientists, however well or ill they may write. The material should be as well written as possible, should be well organized and meaningful; but if it lacks something in the way of art, that cannot be helped. Current writings will constitute a large part of the reading and study of people who live in a growing world. This material should be so written that helps are to be found for the teacher in teaching children how to study it. It should be interesting, detailed, well illustrated, and well indexed, and should contain study questions and exercises. Many recent textbooks have been organized on the unit plan, with suggestions and helps for study much more plentiful than have appeared in books of this kind previously.

The workbook, now become so common, is an attempt to help the teacher teach the children how to study a subject. Some of these books are admirable; others are poorly organized, uninteresting, and not especially helpful. The temptation to the teacher with a workbook is to stop teaching the child how to study and to depend upon the workbook to do the job for him.

In order to study effectively the child must have a textbook.

dictionary, other general reference books, and more detailed and interesting special reference books on a wide variety of subjects. Moreover, he must be taught how to use these books economically and effectively.

Arousing Interest. In order to study effectively, children must not only be interested in the subject of study but also in the most effective methods of study. The problem is not different from getting their interest in the content of what they study. It may be thought at first that concern with methods of study is foreign to the nature of the child and that it ought to be deferred until maturity is reached. This is far from true. Observation of children at work will show that they are capable of taking a great deal of interest in the best procedures to use in searching through books and magazines for data, in organizing reports, in participating in discussions, and in organizing and carrying through activities which necessitate a great deal of hard mental work.

Interesting a child in his own study abilities and habits is probably best accomplished by revealing to him his weaknesses and showing him how to overcome them. If a child finds that he cannot readily comprehend printed material useful to him in his work, and if the teacher will show him how he can improve, he will ordinarily make strenuous efforts to advance. It is only when he is asked to do things without seeing any value in them that he will fail to make an effort. In the middle grades and the junior high school, the child will begin to take an interest in his own study habits and make an effort to improve them. But even in the primary grades the teacher must begin to develop the attitudes, information, habits, and skills essential in effective study. As soon as children begin to show an interest in effective ways of accomplishing study tasks, the teacher may take up directly the problem of learning how to study with them.

Directing Study Through the Assignment. The assignment of lessons has a most important bearing on directed study, whether the school is an old-type or a new-type school, whether instruction is formal or informal. In the assignment the teacher teaches how to study quite as definitely as he teaches it directly through study exercises. Good assignments go far to prevent unnecessary floundering on the part of the child and make study interesting and worthwhile.

Home study needs to be even more carefully assigned than study under the teacher's immediate supervision. Such work should not

be primarily hard, driving preparation or drill, but rather supplementary enrichment of the work begun in class. A common mistake of teachers is to make poor assignments for home study and then, knowingly or not, depend upon parents to do the necessary teaching to make study possible. The development of a new process or the introduction of a child to a new skill is poorly done in home-study assignments. Many parents rightly complain that the teacher merely hears the lessons which they teach.

Differentiated assignments are a great aid to directed study because they discriminate between children who are bright, average, or slow. In practice, however, teachers seldom make sufficient discrimination between the fast and the slow to enable the latter to work successfully. In Cleveland, Ohio, where educators have been experimenting with differentiated material for slow, average, and fast groups, they have found that the bright child is generally given work too easy for him and the slow child, work too hard. By experiments in differentiating the kind as well as the amount of work to be done by each of the three groups, they have found it possible in arithmetic, for instance, to have their slow groups exceed the average achievement of children in the country at large. This advance will come about generally when teachers learn that in differentiated assignments, differentiations must be in kind as well as in amount.

Working out a pattern of study by prestudying material in class is an excellent way of preparing for success in study. The assignment may often be profitably engaged with this type of activity, particularly at the beginning of the study of a subject or when some new process or unit is being introduced.

Recitation and Discussion. The recitation or discussion period may be used profitably for teaching a child how to study new material no less than for the discussion of material which he has studied. When a study lesson is the order of the day, the teacher should attempt to get study under way profitably. He may do this by discussion in which the gaps in the children's information appear; he may have found that they have been having difficulty in outlining, summarizing, locating materials, finding the answers to questions, etc. In this period, ordinarily assigned to recitation, he may then conduct a study lesson, initiate the study of new material, give practice in improving ability to study, or study with the children, showing them how to proceed.

Study is generally initiated in a social setting. Class discussion and group planning and purposing are the beginning of an interest in a new project. The teacher may talk, question the children, start and encourage a discussion, or raise problems with pupils to stir their interest in some new type of activity. When doing this, the old kind of recitation will necessarily disappear and the new recitation will be a socialized reporting, discussion, and planning period.

Although in the assignment and recitation the teacher incidentally gives much information to the children about how to study, special periods are needed for teaching the use of the table of contents, the index, note-taking, how to memorize, the making of an outline, how to summarize, the planning of a report, and the like. Such information should be given when children have found a need for it.

Appraising Results and Diagnosing Errors. To evaluate the study habits of a pupil and to find out what he can and cannot do offers a challenge to the teacher that is seldom met. The teacher must study each child individually, learn what the child can and cannot do and determine progress or lack of progress. Reading tests of the work type, such as the Sangren-Woody⁶ Reading Test and the Iowa Every-Pupil Test of Study Skills,⁷ will reveal basic weakness in ability to read material, such as is commonly used in study, and indicate needed remedial work. In a like manner, tests of the subject matter of history, geography, and so on, which involve comprehension rather than remembrance, may be used to discover the inabilities of children and form the basis for remedial work. The results of general achievement tests are seldom analyzed sufficiently to make the results useful for this purpose.

Recently considerable attention has been given to the use of inventories and questionnaires to evaluate study habits. Many of such instruments are available. Hildreth⁸ mentions twenty-two devices for testing study habits. A list of several is as follows:

Briggs Dictionary Test
Cavins Dictionary Test

⁶ Sangren, Paul V., and Woody, Clifford, *Sangren-Woody Reading Test*. New York: World Book Co., 1926.

⁷ Spitzer, H. F., *Iowa Every-Pupil Tests of Basic Skills: Advanced Battery: Elementary Battery*. Boston: Houghton Mifflin Co., 1940.

⁸ Hildreth, Gertrude H., *A Bibliography of Mental Tests and Rating Scales*, second edition. New York: Psychological Corporation, 1939. Pp. 155-56.

Studiousness Rating Scales
Study-Habits Questionnaire
Illinois Diagnostic Study Tests
Attitudes and Skills in use of References
Study Outline Test
Study Performance Test
Tyler-Kimber Study Skills Test
Reading Study Habit Scale
Wrenn's Study Habits Inventory

Robinson⁹ thinks that the study questionnaire is a quick means for students to register their complaints to the counselor. He believes that to have students merely read the study questionnaire for self-treatment is an ineffective way to help them. It may therefore be presumed that study habits inventories and questionnaires are instruments for use by counselors to make diagnoses and suggestions.

The assignment of a paper at the end of the study of a unit of work is often a good means of testing the pupils' ability to organize the material which they have studied and to use it in a constructive way. A careful reading of such papers may tell the teacher more about the abilities of his pupils, their inconsistencies in thinking, and their power to organize and express ideas than he could learn in any other way.

The types of tests which are administered at the end of a unit will do much to dictate how children will study the succeeding units. If the teacher asks mainly for facts, children will memorize facts. If the tests are plentifully interspersed with questions demanding organization of thought and solving of problems, an entirely different kind of study activity will be encouraged. The teacher should make sure that his tests of how to study are not merely tests of ability to memorize facts.

STUDY QUESTIONS

1. How has the responsibility of the teacher changed with respect to directing the study activities of children within the past two decades?
2. What is directed study?
3. What is supervised study?
4. What is the relation between directed study, directed learning, and directing learning?
5. What organized plans for directing study are now well known?

⁹ See footnote in article by Brooks and Heston, *op. cit.*, pp. 257-58.

6. What is the peculiar task of the elementary school in teaching how to study? Of the secondary school? Of the college?
7. What does teaching to study involve?
8. What does teaching to read have to do with teaching how to study?
9. What objectives or aims may be present in a lesson in which the teacher is attempting to teach children how to study?
10. What subject matter is involved in teaching how to study?
11. How may the child be motivated to learn to study effectively?
12. What is the relation of the assignment to teaching how to study?
13. What recitation activities may occur in a lesson on how to study?
14. How may the teacher evaluate his efforts in teaching children how to study?
15. What are the educational outcomes of lessons on how to study?
16. How much incidental teaching of how to study will the teacher ordinarily do?

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Chapter XV THE SOCIALIZED CLASSROOM

A changing aspect of teaching in recent years has been the disappearance of the formal recitation, once so general, in which the children recited and the teacher heard their lessons, questioned them, marked them, and made running suggestions and corrections. The socialized classroom that has taken its place has been a natural outgrowth of a changing philosophy and psychology of education which emphasizes the organismic nature of the learning process. In the preceding chapters, lesson-planning, assignment, questioning, and directing study have been presented as important technical activities of the teacher. In this chapter, an effort will be made to provide a thorough treatment of the principles involved in the management of socialized classroom activities which logically follow.

The Teacher a Director of Activities. A classroom is socialized when a friendly spirit of cooperative work prevails. It is nonsocialized when the teacher is the chief actor and when the children recite only when called upon. There are several factors which contribute to the socialized spirit. Perhaps the one greatest factor is the teacher's personality and his attitude toward children and teaching. In a socialized classroom the teacher is a member of the group and exercises leadership, but keeps authority in abeyance. He tries to be a cooperative director and participator and to avoid giving the impression that he is chief actor in the classroom drama. In other words, he abandons the time-honored dictatorship for a participating membership in the group and acts as general consultant and advisor. He does not abandon his responsibility for teaching, but

exercises that responsibility in a different way, by suggestion rather than by command.

Importance of the Setting. It is important that the proper social setting be arranged for a socialized classroom. Certain forms common to the traditional classroom are abandoned and others are set up in their place. The children assume greater responsibility and more leadership. A child is often chairman of the group, and the amenities of socialized living become more prominent. But the most important thing of all is a changed spirit of cooperative work and play which gives each child a share of responsibility for the welfare of the group and which respects the personality of each child. Naturally, as children gain in ability to manage themselves, the teacher exercises less obvious control and teaches increasingly through indirect rather than direct means. The essentials of a proper social setting vary in detail in different classrooms, but the fundamental considerations are the establishment of a feeling of mutual confidence and respect among all members of the group, an abeyance of the military spirit, a chance for each member to speak freely and to contribute to the group activity, the observance of the ordinary conventions of polite intercourse, and the abandonment of formalism—of question-and-answer activities of the older type.

Pupil-participation is thus increased as much as possible and teacher-participation of the older type is reduced to a minimum. Children are discussing, questioning, reporting, planning, working, in natural ways. The teacher is guide, counselor, advisor, contributor, and director in the best sense of the word, trying to get children to discover things for themselves rather than to have them merely listening to him and trying to commit words to memory. Emphasis upon verbal memorization is at a minimum.

New Knowledge Needed by the Teacher. The teacher must familiarize himself with the social experiences of his pupils outside of school, for these have a great deal to do with the success of an enterprise. Some pupils will be cooperative because they come from homes where the friendly group spirit exists. Others will not understand the new spirit because of familiarity with a life where it does not obtain and will be slow to adjust themselves. Still others will be positively antisocial in their attitudes. These different types of social attitudes must be known to the teacher and he must manage so as to utilize the cooperative spirit of the few until he is able to

develop it among all the members of the group. This will not be difficult to do if he genuinely desires to develop children socially and makes them feel that the activities of his class are to be conducted in a true spirit of cooperative living together.

New Forms of Class Organization Not Essential. The form of the class organization is believed by some to have a marked effect on socialized activities. Therefore some schools change the form of organization and adopt a scheme of procedure based upon parliamentary law, electing a chairman and enforcing the usual rules of procedure. This seems scarcely more advantageous than the older form of organization, unless the barriers of self-consciousness can be broken down. A true socialized activity does not require a change in form but rather a change in spirit. Small informal groups, rotating chairman, committee work, and informal discussion, as well as formal meetings, are helpful in developing the socialized spirit. Too formal organization will tend to inhibit the pupils and defeat the purpose of the teacher.

The Teacher's Personality and the Socialized Recitation. The teacher's personality is obviously an important factor in socialized group activity. He must be essentially a cooperative being. It will be hard for a driving military martinet to disguise his real belief in and love for authority of the older type under a smooth and self-effacing manner. First of all, the teacher must be genuine in his desire to develop the social consciousness of his pupils; and second, he must strive to be kindly, sympathetic, respectful of the pupils' personalities, even-tempered, patient, but withal strong and persistent. He must exemplify in his personality the cooperative spirit.

Effect of Classroom Arrangement. Classrooms equipped in the regular manner with long rows of seats and the usual teacher's desk prominently displayed in front of the room may work against the socialized spirit. Some schools are now breaking up this formal arrangement for a more informal one, with small groups of seats arranged together, or with tables and chairs instead of the traditional desks and with the teacher's desk to the side or in the rear. The new equipment is doubtless a help, but even with a formal classroom arrangement the socialized spirit may prevail. It is the spirit of the class rather than the form of the classroom or its equipment which is important. The form of the socialized activity is a matter of secondary importance. Forms are merely convenient ways of behaving which people have adopted in order to

work effectively and economically. It is the spirit of the teacher and the pupils which creates a socialized activity or discussion.

Changed Attitudes and the Socialized Recitation. The pupil's attitude in a socialized classroom is not an instinctively defensive one as in the traditional school. He has learned that he really is a member of a cooperative working group. The teacher has shown by his manner that he is genuinely desirous of giving the pupil an opportunity to be free and independent so long as his activities are directed toward the welfare of the group. He is commended for good work by both the teacher and his fellow pupils, and if he is normal he soon learns that he is a partner in a worthwhile cooperative enterprise.

The friendly group attitude is more easily obtained by the socialized procedure than by the traditional type of formal recitation because a marked contrast is obvious in the teacher's attitude, in the purposes set up, in the amount of teacher participation, and in the sincere spirit of working together which characterizes the new way of doing things.

Objectives or Aims of Socialized Class Work. The one important aim of the socialized classroom is to increase activity on the part of the pupils and to teach them to live, to work, and to play together in a friendly cooperative way. In doing this, it is necessary that the pupils as well as the teacher constitute the audience, that pupils teach one another to a considerable extent, that they learn to give and take, and that they develop a sense of responsibility for the welfare of the group. This method tends to improve the individualistic attitude of the strong and to develop the powers of the weak or docile child. The reduction in the amount of formality which characterizes the traditional recitation tends to establish a friendlier feeling between teacher and pupils and to encourage naturally diffident pupils to become more self-confident. It also encourages the spirit of play as well as of work, since it utilizes the children's cooperative tendency and allows them freedom in planning, in gathering information, in reporting, and in discussion as well as in other ways. The value of utilizing the natural interests of children in activity cannot be overestimated. By this method the bluffer is brought to light and shown up by his own peers, and the tendency to show off is often developed into the desire to do real service to the group. Subject matter becomes useful material to be used in achieving certain desirable ends. All in all, the socialized classroom

affords an opportunity for the observation of the principles of *learning through doing* which were developed in Chapter II.

Types of Organization. The different types of organization for socialized teaching and learning may be characterized as the informal group plan, the institutionalized group plan, the self-directing group plan, and the seminar group plan. The least effective of all is the conventional group plan with its high degree of centralization of authority and activity in the teacher and the ordinary question-and-answer activity of the pupil.

1. *The Informal Group Plan.*¹ The informal group plan, which has been effectively used by teachers, consists in a change in attitude and spirit rather than a radical change in class organization. The center of gravity is in the activity. Children and teacher discuss their problems and projects informally. They work together. The teacher may be the leader, a child for a time may assume leadership, or a group of children may be in the center of things. Teacher and children understand that everyone is free to challenge, ask for explanations, volunteer information, be called upon to report findings, be asked to undertake a special investigation for the good of all, and otherwise act as a worker or player in the group enterprise. The teacher is recognized as leader because of his maturity and education. In such a scheme there are no formal leaders, committees, or programs except when such formal occasions are demanded for the entertainment of others. The work and play spirit prevails in a natural and normal way.

2. *The Institutionalized Group Plan.* The institutionalized group plan is an imitation of adult forms of institutional organization. The class may be organized as a city council, a court, a club, a senate, or as a business or professional organization of some kind. This plan requires the election or appointment of officers, the keeping of records, and other features of formal institutional organization. Theoretically it teaches pupils how to take part in institutional life and prepares them for the duties of citizenship. It gives an opportunity for children to learn leadership. Adversely, it may engender stereotyped forms of activity and may encourage the few able pupils to develop their powers without giving the less able an opportunity to grow. The plan requires a great deal of wise man-

¹ Barnard, W. H., "Note on the Comparative Efficacy of Lecture and Socialized Recitation Method versus Group Study Method," *Journal of Educational Psychology*, Vol. 27 (1936), pp. 388-90.

agement on the part of the teacher. He must see that all the children have a chance to assume leadership; he must train the group in the proper functions of each member and teach the form of organization appropriate to the activity. The plan seems best for certain types of training in more or less formal group activities in the upper grades and high school. The organization of a civics class as a court, council, or legislative body may seem appropriate for a limited time. Formal institutional organization must be changed often or they will become monotonous and ineffective.

3. *The Self-directing Group Plan.* The self-directing group plan is only a slightly different type of socialized organization from the informal group plan. The responsibility of the pupils for the activities of the class is somewhat greater. Pupil committees are given more responsibility. The teacher may serve to a greater degree as a referee in case of dispute and as a less prominent adviser and counselor than in the informal group plan. The difference is, however, more a matter of degree than of kind. It would seem that the self-directing group plan would be more appropriate for the upper grades, high school, college, and university than for the elementary school. The great advantage of such an organization is that it constantly emphasizes the duty of responsibility and that it gives children ever-increasing opportunities for the exercise of initiative and independence. Through participation in the actual planning and carrying out of activities many believe the child will derive more permanent value than from any amount of activity directed by the teacher in which he does not have a cooperative part.

4. *The Seminar Group Plan.* The seminar group plan has generally been characteristic of advanced classes in the college or university. There has been some use of the idea, however, in the elementary and secondary school. Each individual in the seminar group either takes part in the carrying out of a separate individual investigation or assumes a share of a larger project. He works individually or in a small group, largely under his own direction. Periodic reports and discussions are held. The peculiar characteristic of the seminar is generally the critical evaluation of the work of the individual members by the group in conference. The teacher is the leader of the seminar but the work of the group consists largely of the reports of the studies made by the individual members or of small cooperating groups. There is a true socialized spirit—planning, organizing, collecting, reporting, discussion, and eval-

uation. The members of the group are recognized as co-workers, their rights and opinions are respected, and the appreciation of their fellows is the main reward aside from the satisfaction of the work itself. This type of socialized group is appropriate for the upper grades, high school, and college. To a certain extent it may be used in the middle grades.

Advantages and Disadvantages. In all the forms of organization discussed in the preceding section there is apparent a trend away from teacher activity and dictation toward pupil activity and self-direction. The obvious value of socialized activity may be seen in two directions: (1) it gives the child training in socialized living; and (2) it makes work and play pleasurable because it gives each member of the group a share in the responsibility. The disadvantages of socialized classroom activity lie in its misuse by a teacher who does not understand it fully. Children may waste time, organization may be ineffective, and the social spirit may be artificial and unreal. In the hands of a good teacher, however, the advantages inherent in organization of some form of socialized activity seem to outweigh by far any possible disadvantages.

Teacher and Pupil Activities. Incidentally, in the previous sections, much has been said or implied concerning the activities of both teacher and pupils in a socialized organization for instruction. Nevertheless, at this time it seems necessary to indicate systematically in a general way the activities appropriate to each.

1. *The Teacher's Activities.* The teacher's activities in a socialized classroom begin long before the group activity begins. As the leader of the group, he is responsible for its progress. He is also responsible for the development of the fundamental attitudes, interests, ideals, information, skills, and habits necessary for successful participation in socialized activities. For this reason, he must see far ahead and plan wisely in order that the progress of children may be certain and that they may quickly learn how to work and play together. His previous training and experience with children make him familiar with their nature and their needs, and so he has a definite plan of procedure for their activities. Yet he does not desire to impose this plan upon them without their understanding and cooperation. Therefore he plans a series of situations in which the need for cooperative activity will arise and he has, in general, an idea of what is going to happen. He knows that his approach to these situations must be made carefully, and he must gain the confidence

and the cooperation of the children, that his attitude toward them is an important factor, that he must appear as a friendly and interested person with many suggestions for interesting activities. At the same time, he must not lose sight of his responsibility as a teacher for planning sufficient practice in skills and for organizing the activity so that important bodies of subject matter are met and used in the furtherance of the activity. To these ends, he plans his series of activities most carefully and organizes his materials so that children are sure to have a profitable experience.

When the time for the socialized discussion or work period comes, the teacher is ready to act as guide, counselor, suggestor, contributor, evaluator, and director. He tries to get children to plan and organize, to initiate activity. He is patient with their mistakes and does not hurry them, but watches carefully for the signs of difficulty and tries to get them to solve their own problems if possible. However, he does not hesitate when necessary to criticize and suggest, to disapprove, and to set them on the right track. In all this he refrains from dominating the situation and seeks to get the pupils to take ever-increasing responsibility. He keeps his hands off the situation when it is going satisfactorily and tries to make the children increasingly active while he assumes less and less of the responsibility for leadership. Watchfully he encourages every sign of independent thinking, every suggestion of growing power in initiative and independence. His fundamental objective is to further the growth of children through their own efforts.

Nevertheless, while the foregoing discussion is in all essential aspects true, there is no suggestion that the teacher shall not be an important contributor and participant in the work of the group. To withdraw entirely from the activities of the group would be unwise and a distinct shirking of responsibility. The teacher as a working member of the group will naturally make his contribution whenever it seems opportune. Children will look naturally to him for guidance, criticism, contribution, and suggestions. It is only the thoughtless who imagine a school running by itself with the teachers away on a vacation. Even adult society does not run without its presidents, legislatures, courts, and officers of the law. How much less possible for classes to run without teachers, the managing directors and the chief contributors to the socialized activities of children!

2. *The Pupils' Activities.* The activities of children in socialized

situations are implied in the description of teachers' activities. As members of socialized, cooperating groups it is the part of children to be participators, contributors, evaluators, suggestors, and planners. Since the setup is designed for their benefit, the more they have to do with the activity the better. In a socialized situation the pupils are the actors, the audience, and the critics of their own performance. Besides, they are in the way of being authors, managers, stage hands, orchestra, ushers, and ticket sellers. There is nothing in which they may not and should not have a part. They plan, organize, collect, report, and evaluate the work of others. They are responsible for the success of the enterprise as cooperative agents.

A typical socialized activity finds the teacher and pupils together ready to discuss a problem, plan some future activity, report the results of investigations, evaluate what has been done, and suggest what needs to be done to carry to a completion the activity already begun. The teacher may be the leader and ask for reports of work done. The children may be called upon by the teacher or may volunteer to report. Each child is given the floor in turn. He reports what he has done. The class sits in judgment as well as in appreciation. Pupils ask him questions. They criticise his results. He answers their criticisms. The teacher questions him and even defends him if he thinks the class criticism unjust or too severe. After all pupils have reported, the teacher opens discussion. Tentative conclusions are made. New problems arise. New duties are assumed by the individual members of the group. The teacher makes suggestions. Materials are obtained and the group goes to work to carry on the project further. Each has had a part in the activity. Hard work has been done but, withal, in a fine humor. An additional step has been made in learning how to work together.

Outcomes. The outcomes of the socialized work and play should not be hard to enumerate. Since the obvious purpose of such a procedure is to give pupils an opportunity to learn how to work together the following outcomes logically ensue:

1. Pupils learn to plan activities.
2. Common interests and purposes are discovered.
3. Practice in leadership is gained.
4. Initiative is encouraged.
5. Independence of thought is achieved.
6. Training in courtesy is given.

7. Ability to report is developed.
8. Pupils learn how to take part in discussion.
9. Practice is had in passing judgment.
10. Extensive experience is made possible.
11. Self-confidence is gained.
12. Respect for others is developed.
13. Cooperation is learned.
14. Teachers know pupils better.
15. Pupils have greater admiration and respect for teachers.
16. Learning is more highly motivated.

These are some of the outcomes of socialized procedure. There are doubtless many concomitant learnings which have not been enumerated. It is to be noted that these outcomes are important not only in school, but in life situations outside of school among both children and adults. To learn how to behave in a socialized setting is not only good fun, but it is also good education.

Appraising Results. The evaluation of a socialized procedure of any kind may be made on the basis of a set of criteria as supplied by a useful check list, such as that furnished in the accompanying workbook, *Directed Study and Observation of Teaching*. Evaluation is possible by several methods: (1) subjective evaluation of an offhand nature; (2) more objective evaluation with a check list and a set of standards; (3) measurement by formal or informal tests; and (4) evaluation under controlled experimental conditions. The latter is the true test of the worth of socialized procedures, but since scientific appraisal is not generally available to the teacher, he is advised to evaluate by means of his own informal tests and check lists. Offhand judgment is not very reliable. The following set of points is suggested as a very general outline for the evaluation of a socialized recitation by the check list.

BRIEF CHECK LIST FOR EVALUATION OF A SOCIALIZED
CLASSROOM ACTIVITY

(Check correct answer)

	YES	NO
I. <i>Purpose</i>		
1. Was the purpose of the activity made clear?...	_____	_____
II. <i>Teacher Activity</i>		
1. Did the teacher direct activity without dominating it?.....	_____	_____
2. Did the teacher make a contribution to the activity?	_____	_____

BRIEF CHECK LIST FOR EVALUATION OF A SOCIALIZED
CLASSROOM ACTIVITY (*Continued*)

(Check correct answer)

	YES	NO
3. Did the teacher make suggestions for improvement?	_____	_____
4. Did the teacher succeed in making the activity general (<i>i.e.</i> , did all pupils participate)?.....	_____	_____
5. Did the teacher stimulate the children to further activity?	_____	_____
6. Did the teacher succeed in directing the activity into profitable channels without using harsh methods?	_____	_____
III. Pupils' Activities		
1. Did pupils assume responsibility for the activity?	_____	_____
2. Were they effective in presentation and discussion?	_____	_____
3. Did they evaluate results intelligently?.....	_____	_____
4. Were they appreciative of good work?.....	_____	_____
5. Did they receive criticism in a friendly spirit?..	_____	_____
6. Did they show signs of enjoyment?.....	_____	_____
7. Did they show initiative in thought or action?..	_____	_____
8. Did they show independence of thought or action?	_____	_____
9. Did they make progress in the recitation?.....	_____	_____
10. Did they make suggestions for future activity?..	_____	_____
IV. Outcomes		
1. Did the pupils gain new information?.....	_____	_____
2. Did they make some advance in skill?.....	_____	_____
3. Did they consistently assume the cooperative attitude?	_____	_____
4. Did they gain new knowledge?.....	_____	_____
5. Did they make progress in learning how to work together?	_____	_____

A predominance of checks in the "Yes" column means a good activity. A little practice with even this rather brief form will enable the student teacher to become a good judge of a socialized activity and the experienced teacher to evaluate his own procedures.

STUDY QUESTIONS

1. What are the chief objections to the traditional type of recitation?
2. What definition of the socialized activity seems most effective to you?

3. When is a classroom socialized?
4. What is the effect of the teacher's personality on the socialized procedure?
5. What type of social situation must prevail in a socialized classroom?
6. How does the teacher teach in a socialized situation?
7. What information about the social situation outside the school must the teacher possess?
8. What is the relation between the participation of teacher and pupil in the socialized activity?
9. Describe the effect of form of class organization on the socialized classroom.
10. Is it necessary to change the seating in the classroom?
11. What is the probable effect of informal grouping of the pupils?
12. What are the chief objectives of the socialized procedure?
13. What types of organization are possible in the socialized classroom.
14. Evaluate each of the suggested forms.
15. Describe the teacher's activities in an ideal form of the socialized activity.
16. Describe the pupils' activities in some detail.
17. Outline in a general way the sequence of activities in an ideal socialized recitation or discussion.
18. Discuss the outcomes of the socialized class activity as outlined in this chapter.
19. Discuss the problem of evaluation of socialized procedure.

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Another important activity of the modern teacher, in addition to those discussed in the preceding chapters of this section, is the diagnosis of learning difficulties. This is a comparatively new type of activity. It represents an attempt on the part of progressive teachers to increase the effectiveness of their methods of teaching. The modern teacher is no longer satisfied with hit-or-miss methods of doing things. He desires to be a specialist as well as a general practitioner. Hunches and guesses are not effective means of disclosing weaknesses and deficiencies in learning. More accurate devices are necessary for diagnostic purposes than for mere observation. As a result of their dissatisfaction with inexpert teaching, many of the more progressive teachers are beginning to employ objective means of finding out children's specific learning difficulties. To what extent diagnosis can be effectively engaged in by teachers, and how it is to function in the classroom, is a problem of great importance. It will be the purpose of this chapter to give the reader at least a general approach to this important problem.

Definition and Development of Diagnosis. Diagnosis is the art or act of recognizing a difficulty by its symptoms. It is an explanation of the difficulty based on an examination of the facts. It may be scientific or unscientific. It is scientific if the explanation is based on facts determined by careful examination of the case with the aid of mechanical instruments or skilled observation, cumulative records, anecdotal procedures, and other techniques involved in the case-study method. In the medical profession, practitioners usually make their diagnoses with the aid of mechanical devices, such as

stethoscopes, thermometers, X-ray machines, etc.; in dentistry the same practice occurs; in engineering the defective aspects of materials are determined through testing; in mechanics, physicists employ galvanometers, barometers, voltmeters, etc., to obtain facts desired for any purpose. Likewise in many other fields of study, the skilled expert employs some kind of mechanical device to assist in making a complete diagnosis of difficulty. To the extent that facts are disclosed in an orderly and objective manner, the diagnosis is scientific. While at the present time mechanical instruments are widely employed in educational clinics, the classroom teacher must rely largely on nonmechanical procedures in the analysis of learning difficulties.

Its Specific Use in Teaching. The practice of diagnosis by the teacher represents the act of discovering and recognizing pupils' learning difficulties from the symptoms which are discoverable in one form or another in classwork. Often the symptoms are apparent from observation, but more often they cannot be discovered until careful measurements are made for diagnostic purposes. In whatever manner the symptoms disclose themselves, they serve as indicators of the source of trouble or difficulty. When difficulties are identified a proper means must be employed to reveal the exact nature of the ailment. The diagnostic test is the instrument developed by educational scientists for the purpose of locating difficulties and, if possible, revealing their causes. The attitude formerly held that general methods of instruction were adequate to reveal learning difficulties is in ill repute among the more advanced thinkers in the field of educational practice. The modern point of view holds that the teacher should be a diagnostician of learning difficulties and should be able to cure them. He must find out the difficulties which children experience in their schoolwork and proceed to correct them by specific forms of activity.

Many of the recent studies of learning show that there are at least two types of difficulties to be recognized by teachers; namely, those due to the inherent complexity of subject matter and its lack of suitability to the learner, and those due to ineffective methods of work which are remediable. An illustration of the former type is the nature and extent of the vocabulary and the complex modes of thought encountered in reading the printed page. An illustration of the latter type is the tendency of children to confuse meanings of words and terms and their failure to distinguish between

essential and nonessential statements when attempting to interpret the meaning of printed matter reasonably adjusted to their abilities.

The Purpose of Diagnostic Teaching. The function of diagnostic teaching is twofold. First, it should reveal the inherent difficulties which subject matter itself presents to the learner, and second, the specific difficulty he has in mastering it. If the difficulty is inherent in the subject matter, the emphasis in teaching will be on reconstructing and adjusting materials to the learner's level. If, on the other hand, the difficulty is inherent in the learner's habits of study or in his ability to grasp a situation readily, the emphasis will be on building up effective habits of work through practice exercises involving perception, recognition, general comprehension, and other mental functions.

However, the diagnostic program frequently extends beyond the function of revealing subject-matter difficulties and faulty techniques of learning textbook materials. It includes an analysis of the pupil's personality in all of its phases and attempts to arrive at a reasonable interpretation of the causes of poor achievement.

A complete diagnosis of each pupil's learning difficulty requires the proper selection and construction of materials for analyzing and studying not only deficiencies in achievement but also weaknesses in personal adjustment. Whether a limited or a more extensive analysis is made will depend upon the seriousness of the problem and the equipment available for making individual case studies.

The Subject Fields of Diagnostic Teaching. Diagnostic teaching is usually limited to the tool subjects: arithmetic, grammar, reading, spelling, and writing. This is chiefly because of the fact that these subjects, as taught, involve relatively specific types of learning which are more easily analyzed than the more complex situations in other areas where the fundamental skills are instrumental in developing more intricate reactions. These fundamental subjects constitute tool subjects which condition one's advancement in gaining other knowledge. In this sense, they are regarded as the most important subjects of the elementary school curriculum, and the ones which are most difficult for the learner to acquire in his beginning school days.

Nevertheless, it is probable that the social studies are much more complex and in the last analysis more important. They are, however, more difficult to analyze, but that should not prevent effort at analysis. Teachers are beginning to realize this fact and

are taking a greater interest in diagnosing children's difficulties in learning history, geography, etc. It is probable that the teacher will find as many children having difficulty with interpretation in the content subjects as he will find having difficulty with the mechanics of the tool subjects. Often, however, if the learner has difficulty in the content subjects, it is due in part to the fact that he has not mastered the skill or tool subjects.

As a rule, children seem not to have as great a difficulty in mastering the social and natural sciences as they have in mastering the mechanics of the tool subjects; but this may be due to the difficulty of recognizing their deficiencies. It is generally rightly recognized that skill and comprehension in reading are basic to the understanding of the printed page wherever it is found—in geography, history, or science. This has brought about an effort to improve reading in these subjects. It must be recognized, however, that the latter subjects may contain special technical vocabularies, charts, diagrams, graphs, statistical tables, and many types of complex thinking which constitute peculiar problems, the mastery of which involves many serious difficulties requiring expert study.

The method of diagnosis in a general way is fairly well worked out for a number of tool subjects, such as arithmetic, reading, spelling, and writing. It is believed that within the next few years methods of diagnosis will be extended to include more subjects of the school curriculum, and that standardized tests of a purely diagnostic nature will appear in larger numbers. While there are many tests now on the market, they are not usually good instruments for diagnostic analysis. Their main purpose seems to be that of testing progress in achieving knowledge rather than specific analysis of abilities and skills. The teaching profession sorely needs more adequate diagnostic measuring devices in all subjects, both in the tools of learning and in the content subjects. The complex nature of learning is just beginning to be appreciated. Until more adequate analyses of learning in various situations are made known, such tests cannot be devised.

Recent developments in diagnosis stress the importance of personality traits, the influence of the social environment, poor teaching, and other factors in causing learning difficulties. These factors cannot be measured by means of standardized tests. They require interviews, observation, and the analysis of anecdotal and cumulative records for successful identification. Whether these factors are

more or less important than skill analysis is a debatable problem among diagnosticians. The authors hold that a complete diagnosis requires careful consideration of both types of data.

The Effect of Diagnostic Teaching on Interest. Efforts by the teacher to discover pupils' learning difficulties tend to have a positive effect in motivating their work. Since the purpose of the learner is to succeed in his work, any aid given him to overcome his difficulties is generally much appreciated. Difficulty is perplexing and, if prolonged, tends to produce inaction in the learner. Diagnosis tends to reveal difficulties due to poor methods of work, emotional blocking, poor environment, personality difficulties, and other causes, and hence to free the learner for effective pursuit of a desired end. Beyond this, interest in the subject or activity as a whole is motivated by the inherent values which the learner finds in it.

The Assignment in Diagnostic Teaching. The assignment in this particular form of teaching often may be largely an individual matter. Ordinarily it should not be made for out-of-class study until it involves learning something with which pupils have been made familiar. In general, diagnostic teaching must first take place in the classroom under the teacher's direction, but following such exercises assignments for independent work may very properly be made. The assignment may consist of written materials containing mistakes which pupils may profitably check out of class to find their errors. In fact, they should be given a great deal of practice, in and out of class, in detecting their own inaccuracies, but it is necessary for the teacher to make a careful check on all such work. Follow-up work is also important. While pupils should be taught as early as possible in their school career to detect their own errors, they should not be allowed to carry on the practice indefinitely unless the work is followed up closely by the teacher to make certain that some improvement is evident. Assignments, therefore, are best when they consist in individual attempts on the part of pupils to eliminate some definite error through practice. Practice exercises in organized form are often excellent for this purpose.

Class Activities. Diagnostic teaching, as at present practiced, involves a number of activities including individual study of the student under laboratory conditions, the use of the case-study technique, general observation and a study of the student's activities, general observation of a class, or the administration and use of tests of various kinds. All of these activities may be appropriate for

either the study period or the recitation. In fact, under such a plan of teaching, recitation as such generally disappears and gives way to work periods in which the teacher makes observations and asks questions or measures, diagnoses, and directs pupils in making their own diagnoses.

While case study involving the administration of individual intelligence tests, performance tests, and other psychological tests is theoretically possible, the average teacher has neither the time nor the training for this kind of diagnostic work, but will have to devote his time to diagnoses which may be made by the use of either formal or informal tests or analytical check lists of various kinds. He may, of course, gather data from the home and community concerning individual children as far as his time and energy will permit. The technique of the teacher in a class period devoted to such work will, however, involve the administration, correction, and analysis of tests and data which are useful for this work.

The Use of Tests in Diagnosis. Tests vary in their usefulness in diagnosis. The oldest type of test of this character which might lend itself to diagnostic use is the traditional essay examination. By the use of an analytical chart of somewhat the following type the teacher might make a useful diagnostic study of pupils' difficulties.

PUPIL'S NAME	CONTENT	ORGANIZATION	ORIGINALITY	MECHANICS
John Doe	Brief	Poor	None	Spelling
Mary Smith	Adequate	Excellent	Several examples	Adequate

Such a chart could be greatly extended and varied in accordance with the subject. Analysis of the pupils' performance by this method reveals that John Doe has certain learning difficulties whereas Mary Smith seems to be making adequate progress. In order that the diagnostic data be available for class use, analysis must have been made by the teacher previous to the recitation. The recitation will then consist of illustrations and explanations of the various weaknesses exhibited in the papers. Through such analysis, pupils will become aware of their specific problems.

The standardized test, originated as a substitute for the written examination, may be adapted for diagnostic purposes. Some few tests of this type are diagnostic in a broad way. Certain tests, such as Charter's Diagnostic Language Tests and the Compass Diagnostic Tests in Arithmetic, are valuable instruments for measuring deficiencies which are more or less common among all children in

certain phases of these subjects. Even these tests, however, are practically useless in revealing the specific difficulty which a pupil may be experiencing in the classroom with nouns and pronouns and with the arithmetic skills of local social value, and they reveal nothing concerning personality and emotional difficulties. Such tests have their limitations in improving instruction and learning conditions among children. An illustration of a rather common form of diagnostic test is given here to show the limitations of such a test in diagnosing specific learning difficulties.

A DIAGNOSTIC LANGUAGE TEST ¹

Directions. If a sentence is correct, place the letter "C" in the blank after it; if it is wrong, place the letter "W" in the blank after it. Study the sample.

Sample

1. Such studies as this are valuable		W
2. Such studies as these are valuable.		C
1. I wouldn't do that if I was you.	_____	14. Have the robins gone South yet? _____
2. I wouldn't do that if I were you.	_____	15. The two boys was sent to the office. _____
3. Jane has gone without her lunch.	_____	16. The two boys were sent to the office. _____
4. Jane has went without her lunch.	_____	17. The package come in the mail. _____
5. He hadn't ought to be late.	_____	18. The package came in the mail. _____
6. He ought not to be late.	_____	19. Each one sat in his seat. _____
7. Me and you can do that.	_____	20. Each one sat in their seat. _____
8. You and I can do that.	_____	21. Where was the books, Mary? _____
9. Put the pencils into the box.	_____	22. Where were the books, Mary? _____
10. Put the pencils in the box.	_____	23. He hurt himself. _____
11. You were the one the teacher called.	_____	24. He hurt hisself. _____
12. You was the one the teacher called.	_____	25. She gave me her book. _____
13. Have the robins went South yet?	_____	26. She give me her book. _____
		27. I haven't no paper. _____
		28. I haven't any paper. _____

¹ The content of this test was determined by B. W. DeBusk in a study of the *Persistence of Language Errors among School Children*. University of Oregon, 1930.

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|--|---------------------------------------|
| 29. Give me those papers. — | 62. Please sit in this chair. — |
| 30. Give me them papers. — | 63. It was he that ran — |
| 31. I borrowed the pen of Henry — | 64. It was him that ran. — |
| 32. I borrowed the pen off of Henry. — | 65. Whom did this come from? — |
| 33. Yes, I saw her Thursday. — | 66. Who did this come from? — |
| 34. Yes, I seen her Thursday. — | 67. She had done it wrong again. — |
| 35. Lay down, Rex. — | 68. She had did it wrong again. — |
| 36. Lie down, Rex. — | 69. It don't matter what you did. — |
| 37. I haven't got no book. — | 70. It doesn't matter what you did. — |
| 38. I have no book. — | 71. Her and him were at the show. — |
| 39. Those girls are good friends — | 72. She and he were at the show. — |
| 40. Them girls are good friends — | 73. I like these kind of pears. — |
| 41. Who saw the show last night? — | 74. I like this kind of pears. — |
| 42. Who seen the show last night? — | 75. There are enough books. — |
| 43. Mary's cat lays near the door. — | 76. There is enough books. — |
| 44. Mary's cat lies near the door. — | 77. He taught me to skate. — |
| 45. This is a secret between you and me. — | 78. He learned me to skate. — |
| 46. This is a secret between you and I. — | 79. He and I heard the speech. — |
| 47. That is him coming now. — | 80. Him and I heard the speech. — |
| 48. That is he coming now. — | 81. Mary and Jane are here. — |
| 49. Have you saw my papers? — | 82. Mary and Jane is here. — |
| 50. Have you seen my papers? — | 83. He threw the ball to me. — |
| 51. Jane likes Betty and I. — | 84. He throwed the ball to me. — |
| 52. Jane likes Betty and me. — | 85. Had she gone when you came? — |
| 53. This here is the prettiest. — | 86. Had she went when you came? — |
| 54. This is the prettiest. — | 87. He ran to the lake. — |
| 55. I did my best. — | 88. He run to the lake. — |
| 56. I done my best. — | 89. We boys will go for you. — |
| 57. It was her that you saw. — | 90. Us boys will go for you. — |
| 58. It was she that you saw. — | 91. She looks like she were ill. — |
| 59. He did his arithmetic at home. — | 92. She looks as if she were ill. — |
| 60. He done his arithmetic at home. — | 93. Wait for we boys. — |
| 61. Please set in this chair. — | 94. Wait for us boys. — |

- | | | | |
|-----------------------------|---|---------------------------|---|
| 95. The boy writes good. | — | 98. Please leave me drive | — |
| 96. The boy writes well. | — | the car. | — |
| 97. Please let me drive the | — | 99. I have ate dinner. | — |
| car. | — | 100. I have eaten dinner. | — |

It will be noted that this test is composed of 50 different items, each of which is intended to reveal a different language error commonly made by pupils in the elementary school. The test is general in its diagnosis. In order to be specific, each of the 50 items which represents a type error would have to be expanded into a single test dealing with just those errors of a particular type.

The teacher's use of this test for diagnosis is therefore limited by the adequacy of the test. The informal objective test which is given below is much more specific than the one above but it may not be specific enough to be a good diagnostic test unless the language errors which it contains are found in the unit of material for classwork.

A DIAGNOSTIC LANGUAGE TEST

Directions. Each of the sentences in this test contains two words in parentheses, one of which makes a sentence correct. Write the word which makes the sentence correct in the blank space after it.

Sample

- | | |
|--|-----------|
| 1. The boy (fell, falled) off the porch. | fell |
| 1. John said the pony (did, done) as it was told. | 1. _____ |
| 2. He (run, ran) nearly a city block. | 2. _____ |
| 3. They (seen, saw) the boat race. | 3. _____ |
| 4. She (sat, set) the vase on the stand. | 4. _____ |
| 5. The children (burst, busted) their toy balloons. | 5. _____ |
| 6. The janitor (rang, ringed) the bell at nine o'clock. | 6. _____ |
| 7. The pupil (knowed, knew) he was right. | 7. _____ |
| 8. His record was (broken, broke) only once before today. | 8. _____ |
| 9. They have (went, gone) already. | 9. _____ |
| 10. The life guard (dived, dove) into the pool. | 10. _____ |
| 11. The boy (drank, drunk) too much pop. | 11. _____ |
| 12. They (drawed, drew) lots to see who would do the work. | 12. _____ |
| 13. The picnickers (et, ate) their lunch in the grove. | 13. _____ |
| 14. He (drived, drove) nails in the plank for sport. | 14. _____ |
| 15. The boy (swam, swimmied) across the lake. | 15. _____ |
| 16. He (set, sat) there for almost two hours. | 16. _____ |
| 17. The injured man (lay, laid) on the ground several hours before he was found. | 17. _____ |

- | | |
|--|-----------|
| 18. He (wrote, writed) a letter to his friend. | 18. _____ |
| 19. The pond was (froze, frozen) over about a month earlier this winter than last. | 19. _____ |
| 20. She said she was happy now because she was (rid, ridden) of all her enemies. | 20. _____ |
| 21. He said he (came, come) only as a spectator. | 21. _____ |
| 22. They (threw, throwed) baseballs into kegs. | 22. _____ |
| 23. The teacher wanted to know how he had (tore, torn) his coat. | 23. _____ |
| 24. He said the loud noise (awaked, awakened) him last night. | 24. _____ |
| 25. Tabby (set, sat) watching the mouse. | 25. _____ |
| 26. He asked if we ever (rode, rided) a roller coaster. | 26. _____ |
| 27. He had (rang, rung) the bell louder today than usual. | 27. _____ |
| 28. No one had (saw, seen) him for many years. | 28. _____ |
| 29. They (ridded, rid) the ground of rubbish. | 29. _____ |
| 30. The boys (took, taked) their baseball mitts with them. | 30. _____ |
| 31. He said he (laid, lay) the sweater on the bench. | 31. _____ |
| 32. He (brokeed, broke) his previous record in swimming. | 32. _____ |

This test is more specific than the other, because its items are limited to particular verb forms—the tenses of verbs. It would be more specific if its elements were limited to the inflections of a single verb. However, such a test is neither practical nor necessary, for the reason that many verbs have their principal parts formed in a regular way. It is always more desirable and satisfactory to include in a test as many items as are consistent with good testing practice. The greater the number of items, the easier it will be to get a good distribution of performance on a test.

Such tests as the preceding may be used frequently in the skill subjects for discovering the weaknesses of pupils. To be most effective they should be simple in language and should be practically self-corrective. The arrangement of the preceding tests is good. Either teacher or pupil could score the tests and a list of the errors made could easily be determined. For the sake of economy, it is well to train children to score their own tests and to make, in so far as possible, their own diagnoses. Those tests which are objective in character, that is, which permit the pupil to underline, cross out, or match items, are better for this type of analysis of specific learning items than those which require a great deal of writing and which present difficulties in determining the right answers. How-

ever, it must be recognized that analysis of the integrated use of facts and skills in various forms of expression is also highly important.

A plan of diagnosing which the teacher will find most practicable in disclosing weaknesses in learning is that of devising informal objective tests, such as the preceding samples illustrate. The advantage of this practice is that the teacher can adapt the test to the particular unit of material under consideration in class. Regardless of the nature of the subject matter being taught, the practice of correlating tests and materials will be found most effective for diagnostic purposes. Some knowledge of test construction will be necessary. Usually the procedure to follow in this connection is to determine the function which the test is to serve. Then analyze the materials of the given unit for the purpose of finding out what kind of exercises can most readily be made from them. If the materials are suitable for a matching test, organize and construct a matching test. If they are not, then try some other form of an objective test,² such as a multiple-response, alternate-response, identification, or enumeration test. After the testing exercises are made out in longhand, they should be typewritten for the purpose of making duplicate copies with the hectograph or mimeograph. When sufficient copies are printed, the test may be administered and checked like any standardized test. The length of exercises, time limits, and other conditions of the test may vary according to the purposes for which it is to be employed.

The Use of Check Lists. Analysis by check lists which involves general observation and checking of behavior, such as the Gray Oral Reading Test, is another form of diagnostic teaching which may properly consume time formerly devoted to recitation. The check list may be made up by the teacher or borrowed from those already prepared by experts. An example of such a check list in *Reading and Study* has already been referred to. Zirbes in the *Twenty-fourth Yearbook* of the National Society for the Study of Education gives an excellent analytical chart. The procedure is for the teacher to engage children in some activity and then by observation to check the errors in their responses. This is particularly useful in oral language and in other types of overt response. See the check lists in *Directed Study and Observation of Teaching* for examples of semiobjective check lists for various purposes.

² See Chapter XX, *Tests and Examinations*.

The various activities of diagnosis suggested in this section are only a few of the many diagnostic activities which may be undertaken by the intelligent teacher. He must always keep in mind that one of the main objectives of diagnostic teaching is to train pupils to diagnose and correct their own weaknesses. Independence in diagnosing and overcoming weaknesses is necessary for effective work as well as play.

The Results of Diagnostic Teaching. It is doubtful that any teaching activity serves so definitely to establish fundamental habits of work and study as does diagnostic teaching. It makes pupils conscious of their weaknesses and of the necessity of being on the alert for their mistakes. It represents a scientific way to go about uncovering incorrect forms of study activity. Wrong tendencies to action are revealed as soon as symptoms of them appear in classroom work. Diagnostic teaching reduces the number of special problem cases to a minimum, prevents the development of ineffective habits of work, and at the same time develops a wholesome attitude among pupils toward their schoolwork. If the practice of diagnosis is carried on specifically, it will do much toward saving pupils from the effects of protracted wrong reactions and the development of habits which may deter progress.

STUDY QUESTIONS

1. What is the general meaning of diagnosis?
2. What is the educational meaning of the term?
3. Why should the teacher be an expert diagnostician?
4. What are the symptoms of weaknesses which may be disclosed by pupils in learning?
5. What is the value of heeding symptoms of weaknesses in the pupil's learning?
6. What is the difference between diagnostic and remedial teaching?
7. Why is it important that pupils be taught early in their school careers to detect their own weaknesses in learning?
8. Why will it be necessary, in most instances, for the teacher to make his own objective tests for diagnostic purposes?
9. What are the limitations of standardized tests in diagnosing learning difficulties?
10. Why is it important to correlate diagnostic tests and materials for study?
11. What are several types of ready-made materials which may be employed for diagnostic purposes?

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Chapter XVII REMEDIAL TEACHING

Remedial teaching logically follows diagnostic teaching, discussed in the preceding chapter, as an important teacher activity. In fact, the two types of teaching are normally aspects of a unified process in which the teacher attempts to discover and remedy the errors in learning which children commonly make. Some lessons are solely diagnostic in character; some are entirely remedial. Generally, however, they are intermixed in such a manner that it is impossible to separate them except for purposes of analysis and discussion as in this chapter. Since remedial techniques are comparatively new, it is necessary that the student of teaching give special consideration to the subject.

Remedial Teaching Defined. Remedial teaching is actually old, since good teachers from time immemorial have always tried to correct the errors in children's learning and set them on the right track. The new remedial teaching has received a stimulus from the testing movement, however, and has been given a name borrowed from the medical profession. It has for its purpose the development of effective techniques for the correction of errors in all types of learning. As yet, it has been more effectively used in the skill subjects than in the social studies. This is probably because the errors in learning may be more easily detected in the former than in the latter.

Remedial teaching tries to be specific and exact; it attempts to find a procedure which will cause the child to correct his errors of skill or thought. It aims to correct errors of the past and thus, in a sense, prevent future errors. It is not always successful, but under

favorable conditions, as in spelling, arithmetic, and reading, some unusual results have been achieved. The reports of Gates,¹ Betts,² Durrell,³ Witty and Kopel,⁴ and others on remedial work in reading are suggestive of a type of teaching which in the future may remedy the causes of failure and make possible educational progress by pupils who would otherwise be educational casualties.

Methods Used in Remedial Teaching. Remedial teaching is carried on in several different ways: (1) incidentally, as in the past; (2) by the case-study or clinical method in which individual pupils are segregated for treatment; (3) by systematic treatment of errors before a whole group after diagnosis; (4) by the group-individual method through the use of practice materials administered to the group but designed for treatment of individual differences; and (5) by small group instruction in which the work is largely individualized. In this chapter, methods (3), (4), and (5), which are practicable for the classroom teacher, will be treated. Methods (1) and (2) for obvious reasons need not be discussed.

In the regular work of the classroom, one of the purposes of the teacher is to find ways and means of applying remedies for errors of all sorts. In spelling, for instance, observation of the work of pupils may reveal that they are not following a systematic method of study. Remedial work may consist in instructing them in a better method and having them practice the method under the teacher's supervision until it is learned. In geography, tests or observation may reveal that the pupils are unable to interpret maps accurately, are deficient in vocabulary and ability to read and assimilate geographical material, and have certain wrong geographical concepts. The teacher will use a different remedial treatment for each of these errors. Training in map-reading will repair the difficulty first mentioned; special attention to vocabulary, practice in reading paragraphs under careful control, and additional teaching of the concepts that are wrongly understood will result in improvement in the pupils' ability to study the subject. In all kinds of

¹ Gates, Arthur I., *The Improvement of Reading*, Third Ed. New York: Macmillan Co., 1947.

² Betts, Emmett A., *Foundations of Reading Instruction*. New York: American Book Co., 1946, pp. 114-40.

³ Durrell, Donald D., *Improvement of Basic Reading Abilities*. New York: World Book Co., 1940. Pp. 65-97, also pp. 316-31.

⁴ Witty, Paul, and Kopel, David, *Reading and the Educative Process*. Boston: Ginn & Co., 1939. Pp. 162-202.

teaching situations, necessity for remedial work will often arise.

In more specific remedial teaching, as in (4) and (5), the classroom teacher will need to master the technique of small group instruction⁵ and adapt his method to specific individual needs. This is a more time-consuming process, but also more effective in treating the causes of specific difficulties.

The Uses of Remedial Teaching. Theoretically, the function of remedial teaching is to cure some educational ill. If there are no errors of teaching and learning, there is no need of remedial teaching. Ideally, errors in learning should be prevented and the need for remedial teaching should lessen as teaching becomes more expert. In a sense, the attitude necessary to remedial teaching is that of seeking cures for ills that ought not to have happened. Just as in the medical profession more emphasis is now being placed on preventive medicine, so in teaching there should be increasing emphasis upon teaching so well that error seldom occurs. But as long as human error persists, remedial teaching will be necessary.

The functions of remedial teaching are numerous: to recondition habit and skill, to correct errors in knowledge, to improve personality traits, to resolve conflicts, and to substitute good attitudes, interests, and ideals for undesirable ones. Serious physical, emotional, and social defects of the child will often prevent his learning even though the teacher has used well-established techniques in teaching. Likewise, remedial measures based upon analysis of errors in mechanics of learning will fail unless the physical, emotional, and social defects of the child are successfully treated.

Remedial teaching can no more succeed in every instance, however, than can medicine. Blind repetition of a learning exercise will not cure learning defects. The pupil must recognize errors, see the reason for a different type of performance, and set his will to the right reaction if he is to succeed. Often, therefore, the problem of remedial teaching is one of changing attitudes, removing prejudices, and restoring confidence and morale as well as one of devising good practice exercises and other types of remedial exercises for the removal of the difficulty experienced by the pupil. The most wasteful of all remedial teaching is blind, unintelligent drill.

The problem of remediation in teaching is somewhat analogous

⁵ See Durrell, Donald D., *op. cit.*, pp. 67-73.

to that in medicine. The attitude of the patient, his emotional readiness to learn, and his morale are often the crucial difficulty rather than organic illness. In remedial teaching attention must be given to morale, just as in modern medicine, treatment of the whole personality is becoming increasingly the better practice.

Granting the importance of factors resident in the learner, it is recognized also that there are errors in learning due to the lack of effectiveness of the teaching materials. Educational scientists are now attempting to build not only drill material but better textbooks, auditory and visual aids that will prevent errors in learning. More attention is also being given to readability of textual materials. With respect to drill materials, Knight⁶ says:

It is not at present known what errors are due to genuine learning difficulties and what errors are due to faulty construction of drill. It is probable that much need for remedial work lies not in giving pupils more drill but in giving them better drill from the start. If errors are due to wrong experiences and lack of experiences in systematic drill, then the main drive upon remedial work should be upon reconstruction of drill work from the start.

Remedial work is rightly laying emphasis upon more expert teaching through more expertly made materials. The remedial teacher must seek to use the best of these new materials not only in remedial but in developmental teaching.

Remedial Teaching Possible in Many Fields. Remedial teaching attacks the personality problems of the child and uses many types of experience in its attempts to reorient the child to his world. Since many of the causes of the child's difficulties may reside in his failure to learn to use fundamental tools successfully, it often happens at present that remedial teaching deals with reading, arithmetic, language, spelling, and writing rather than history, geography, science, or other content subjects. There is every reason why more effort should be made to discover and remedy errors in all types of teaching and learning.

Since much of the literature on remedial work deals with attempts to remedy difficulties in learning in the school subjects, a suggestive outline of the subject matter of remedial teaching in the different subject areas follows:

⁶ Knight, F. B., *Third Yearbook*, Department of Superintendence, p. 90.

A FEW TYPICAL EXAMPLES OF SUBJECT MATTER IN WHICH REMEDIAL
WORK IS OFTEN FOUND NECESSARY

Examples from the Tool Subjects⁷

1. Arithmetic
 - a. Carrying numbers in division
 - b. Estimating quotient figures
2. Grammar
 - a. Using the correct forms of verbs that agree with subjects in number
 - b. Making the pronoun agree with the antecedent in number
3. Reading
 - a. Increasing the recognition span
 - b. Correcting irregular eye movements
4. Spelling
 - a. Learning to spell words ending in "able" and "ible"
 - b. Developing a spelling conscience
5. Penmanship
 - a. Getting the correct slant of letters
 - b. Spacing letters and words properly

Examples from the Content Subjects

1. Elementary Science
 - a. Correcting superstitions, fallacies, and prejudices about nature, such as motivate the persecution and destruction of toads, harmless snakes, bats, etc.
2. Geography
 - a. Learning map locations
3. History
 - a. Learning the cause of the westward movement and its effects on our national life
 - b. Learning methods of settling disputes
4. Hygiene
 - a. Caring properly for the teeth
 - b. Protecting one's self against harmful bacteria

This list represents a sample of the nature of subject matter in which remedial work is commonly needed. The list could be extended indefinitely. An analysis of this list of examples will show that not all material which the pupil studies in the content subjects is of the drill type. Much of it will involve thought difficulties, such as comprehending cause-and-effect relationships, following a series of events in history through a certain period, integrating the various political phases of the rule of a given party or dynasty, and the like. Unit activities in history, in science, and in the other

⁷ These examples are based on the difficulties which pupils have in learning subject matter.

content subjects may, and often do, require considerable remedial work.

Securing a Good Mental Set. The motivation of remedial work depends largely upon getting pupils to assume an active mental set toward the overcoming of their difficulties. The child who has failed in learning invariably has an emotional difficulty caused by that failure. Again, failure to learn is often the result of personality maladjustment due to factors in the home and community life of the child. These difficulties must be discovered and changes in the child's attitude made, before successful remediation may take place. In many cases removing the emotional difficulty results in almost miraculous readjustment.

Once the emotional adjustment is successfully made, a positive and active set toward the removal or correction of a deficiency in learning is often created by a careful study of the results of tests, such as making individual and group charts, tables, and graphs. This practice enables children to compare their progress with that of the class as a unit or with one another's. Interest in the activity follows, in most instances, for children become alert and conscious of the need for remedial work.

It is not always an easy matter to make children aware of needed improvement, but this is a crucial point in motivating the activity. Identification prevents the overlearning of already known facts or skills. Needless repetition of familiar and known facts tends to deaden enthusiasm for schoolwork, but when the child feels that his particular problems are being intelligently handled, he becomes more purposeful and finally enthusiastic.

Although some teachers seem to feel that repeated drill is the cure-all of learning difficulties, the opinion of experts is directly to the contrary. One writer⁸ believes that repeating an activity which has already been done correctly does more positive harm than good to the learner. In commenting on the waste of indiscriminate drill, he says:

The repeating of work done correctly does positive harm if continued. No self-respecting pupil of even third-grade judgment can have much respect or loyalty to a drill service which calls for the same treatment of correct work that it does for incorrect work, namely, to do it over.

The practice of needlessly repeating work once done correctly over and over again is without doubt the greatest single factor in

⁸ Knight, F. B., *Third Yearbook*, Department of Superintendence, p. 90.

causing schoolwork to become drudgery, and it is often the primary source of many disciplinary problems in the school.

Independent Study. Independent study by the pupils in remedial work may consist of practicing a needed reaction, as in drill, organizing and reorganizing some difficult aspect of a problem or project in history, or finding and trying out numerous remedies to recondition and correct some fault in language or writing. In any case, detailed assignments to be followed must be discussed and explained in class before remedial work is assigned for out-of-class study. It is often necessary to provide good practice exercises of various sorts to be used by the pupil in independent study to correct the errors which have been discovered in his work. These exercises should correct the specific errors made by the pupils.

The independent work of the pupil requires the expert use of appropriate materials and skilled assignment of work. The teacher must make sure that the pupil knows exactly what he is to do, why he is to do it, and how to do it effectively. Otherwise, independent work may be totally ineffective.

Conducting Class Activities. Class activities in remedial teaching should include morale-building and interest-arousing activities as well as specific learning activities directed at some fact or skill. It is important to treat the child's personality defects, his lack of experience, his lack of understanding and interest, as well as his specific difficulties in learning in the different curriculum areas. In any case, the child must be aware of his difficulties and must understand why he is engaging in the appropriate remedial activities. This fundamental principle is true whatever the type of material with which he is dealing. In the content subjects, remedial activity may often be concerned with selecting the proper sort of treatment for correcting errors in thought or action. In the skill subjects, it may be chiefly drill or systematic practice under guidance. The practice of selecting the proper remedy or treatment and applying it effectively is an important activity in class period.

In remedial classwork it is the teacher's particular responsibility to see that each child is receiving that type of experience which deals most effectively with his particular problem. When using drill as a remedy or treatment, the teacher should be alert to the need for changing practice to meet the changing needs experienced by pupils in their difficulties. Remedial treatment should be flexible but should persist until the specific difficulties of the learner have

been overcome and correct procedure in the area of difficulty has been established.

Types of successful remedial treatment adapted to classroom work have been summarized by various writers, the most extensive and detailed of which are in the field of reading. Gray⁹ gives a list of the most frequently used types of remedial treatment in this area. Examples of these are suggested here for study.

PUPIL DIFFICULTIES	REMEDIAL SUGGESTIONS
1. Limited span of recognition	1. Give phrase drill made up in the form of flash-card exercises
2. Limited ability to recognize words	2. Give training in phonetics, word pronunciation, learning rules for pronunciation
3. Lack of accuracy in word recognition	3. Give word drills in content and flash-card exercises
4. Failure to interpret with any degree of accuracy the printed page	4. Give practice in distinguishing thought units, reading to find answers to questions, and exercises in following directions

A rather complete chart for guidance in diagnostic and remedial work in reading can be found on pages 277 to 287 inclusive, in the *Twenty-fourth Yearbook*, Part I, of the National Society for the Study of Education. A sample of the analysis of diagnostic and remedial work suggested in this yearbook is given below.

EVIDENCES OF DEFICIENCY	DIAGNOSIS	REMEDIAL SUGGESTIONS
Numerous requests for help on simple and common words in oral and silent reading.	Failure to accumulate sight vocabulary as a by-product of reading experience. Insufficient training in sight words.	Provide methods of self-help. Hold pupils responsible for listing words on which they requested help and use the words as a basis of one drill.
Unable to read anything but simple material, but cares only for material beyond his own reading ability.	Ability to read stunted as a result of being read to too much. Interests and tastes developed and satisfied with no responsibility for growth in ability to read.	Read part of a story, stopping to let pupil read on to see how the story comes out. Condition further reading on completion of the story.

It will be noted that this sample includes diagnostic work as well as remedial practice. It is difficult to separate the two activities in teaching, nor is separation necessary except for the purpose of preventing confusion in the mind of the reader. Diagnostic and remedial practice go hand-in-hand in corrective teaching, although at times a teaching period may deal wholly with one or the other activity.

The Use of Tests in Remedial Work. Tests are an essential part of remedial work. They are necessary in checking the effectiveness of the remedy and its application by the pupil. Otherwise it would be impossible to know which treatment was the most satisfactory one to employ in any given instance or situation. Standardized tests are not effective for remedial purposes. They are too general in character, and besides they are not usually based on the particular unit of work in which pupils are interested and engaged. It is necessary for the teacher to devise his own tests for remedial work. These should be short objective tests dealing with the materials under consideration in the classroom. It is important that these teacher-made objective tests cover the difficulties involved in learning the unit.

Outcomes of Remedial Teaching. The significance of remedial work is realized by pupils when they have succeeded in overcoming some specific difficulty or difficulties. Just as in medicine the outcome of treatment is a cure, so in remedial teaching the pupil must experience a definite change in attitude, knowledge, skill, and habit. He must definitely experience improvement. A mental or emotional conflict must be relieved and normal adjustment experienced. The child must learn to organize his ideas better, to express himself more clearly, to think more clearly and to better purpose. Specific difficulties must be met and conquered. Remedial treatment of handwriting difficulties must result in better handwriting. Language errors must be corrected under instruction. The concomitant outcomes of remedial teaching are increased confidence on the pupil's part, satisfaction arising from successful achievement, and better use of good learning and study procedures which will prevent future difficulties.

Preventive Element in Teaching. Removing deficiencies, however, should not be the chief concern of teachers. Remediation is necessary only when preventive measures either have not been used or have been poorly employed. The first concern of teachers should

be to prevent, in so far as possible, any need for remedial work. Although this is, of course, much more easily said than done, it is a sound basis on which to conduct education.

An adequate program of prevention will include a careful appraisal of the children's mental and physical condition, their general readiness to begin new subjects and activities, the adequacy of methods and materials, the external conditions of learning, and the re-evaluation of the policy of promotion. There are doubtless other conditions which should be considered in a preventive program, but those mentioned require first consideration by teachers.

In regard to the general readiness program, it may be said that, since success in nearly all school subjects and activities is conditioned by the ability to read, a reading readiness program is of the greatest importance as a prophylactic measure in learning. Preparing children well in the skills of reading is a necessary step in preventing deficiencies in future learning. Obviously such preparation does not compensate for the lack of intelligence and proper maturation. These are matters to be considered also in a preventive program.

There is evidence that children who have mental ages below six years cannot profit to any appreciable extent by the usual kind of instruction given in reading unless they possess more than average intelligence. Mental age alone does not reveal the potential brightness that exists among children who are relatively bright for their age. Two children may have the same mental age, yet one may have an I.Q. of 140 and the other 100. The brighter child will learn more rapidly and readily. Furthermore, the postponement of instruction until they have reached the ages of seven or eight years does not help matters a great deal under average public school conditions, even though some experiments seem to show delay desirable; for the mere delay of beginning the skill subjects, particularly reading, does not eliminate failures or low levels of achievement. Adequate preparation of children to do first-grade work is one of the surest ways of preventing deficiencies. The types of activities thought desirable are well outlined by such books as Lamoreaux and Lee's *Learning to Read Through Experience*.¹⁰

¹⁰ Lamoreaux, Lillian A., and Lee, Dorris M., *Learning to Read Through Experience*. New York: D. Appleton-Century Co., 1943. Pp. 1-74. See also Thomson, Jennie L., "Big Gains from Postponed Reading," *Journal of Education*, Vol. 117 (1934), pp. 445-46.

Among important preventive measures are the correction of physical defects such as poor vision and hearing, and toxic conditions caused by infected tonsils and adenoids, which interfere with successful schoolwork. Teachers are not expected to correct these difficulties but to aid as far as possible the school physician and nurse to bring about correction before these bad physical conditions do great harm. The present practice in many regions of giving a complete physical examination to all six-year-olds and carefully following up the findings through the use of eye, ear, and general clinical work, promises in the future to prevent educational disabilities before they get started. Likewise the care and feeding of children from underprivileged homes now carried on in many areas, foreshadow the time when physical causes of educational deficiencies will be largely prevented from causing undue harm to the emotional, intellectual, and physical well-being of young children.

Differences in rate of learning require consideration of the materials of the curriculum and the methods which children employ to learn. Adequate materials for a given grade will require levels of difficulty varying from two or three grades below a grade, and four, five, or six levels above. Chapter XXII on individual differences further develops the extent of these differences. In many conventional schools, less than one-third of the children at a given grade level can profit from reading well-graded materials.

The ways and means by which certain kinds of materials can be learned with facility by children require a careful appraisal of the factors which enter into the learning process. Some materials of the curriculum require considerable drill work in learning, while other materials involve more of the thought processes. Most material is best learned in large units and by reciting instead of by mere reading over and over again. These and kindred ways of learning are important considerations for teachers to keep in mind when planning instructional procedures.

A preventive program also requires close attention to proper lighting and seating, and to adequate ventilation and room temperature. It happens in many schools that teachers are more concerned with finding and reporting physical defects than they are with devising ways and means of preventing them. Oddly enough, school administrators and officials sometimes appear to be willing to take every possible means of obtaining desirable facilities for handicapped children, but do little or nothing about providing

similar facilities for normal and well children. Surely preventive measures for well children deserve as much consideration as curative measures for the handicapped.

There are many inconsistencies in the policy of admitting children to the first grade on the basis of chronological age and promoting them to the second grade on the basis of how well they have learned the fundamental skills of reading, language, and arithmetic. Fortunately some of these inconsistencies are being slowly corrected, with the result that children are now admitted to the first grade on the basis of their reading readiness. The adjustment of the program of studies to the needs and capacities of children has also been helpful in alleviating retardation in the primary grades. But in most school systems the problem of what to do with children not ready for reading and other schoolwork has not yet been solved. The solution would seem to be in the direction of modified curriculums for the early years of the elementary school as well as later.

Many investigations¹¹ reveal that from 20 to 40 per cent of first-grade children fail or are not promoted. The percentage is slightly less in the second and third grades. Surprisingly enough, many of the failures are due to deficiencies in reading and not to difficulties in arithmetic and language. Other studies¹² reveal that nonpromotion is caused, in part, by immaturity in reading. It is quite generally agreed among educators that no one set of conditions is responsible for the large number of nonpromotions. The entrance age of children, their previous preparation in the kindergarten, the type of primary-reading program, the grade standards of achievement, the size of classes and related conditions, are all important considerations in establishing policies of promotion.

STUDY QUESTIONS

1. Whence is the term "remedy" derived?
2. What is its medical meaning?
3. What are examples of remedies in school work?

¹¹ Casewell, H. L., "Non-Promotion in the Elementary School," *Elementary School Journal*, Vol. 33 (1933), pp. 644-47. See also Beechy, Atlee, "Pupil Failure in Elementary Schools," *Educational Research Bulletin*, Vol. XXII (1943), pp. 99-101. Ohio State University, Columbus, Ohio, and Stroud, J. B., "How Many Pupils Are Failed," *Elementary School Journal*, Vol. 47 (1947), pp. 316-22.

¹² Books, such as *Reading and the Educative Process* by Witty and Kopel, and *The Prevention and Correction of Reading Difficulties* by Betts, are excellent sources of reference to these studies.

4. What is the chief function of remedial work in school?
5. What is meant by reconditioning undesirable reactions? Illustrate.
6. Why is drill often considered the only remedy for all education ailments?
7. On what phases of drill does Knight believe remedial work should be centered?
8. Why is remedial work not usually extended to include the content subjects of the curriculum?
9. What is the value of reconstructing practice exercises, problems, and projects in remedial work?
10. Why is merely going over and over the same thing devoid of challenge?
11. What kind of remedial work may pupils do out of class?
12. What will be the chief difference between remedial work in the tool subjects and the content subjects?
13. What are several typical examples of subject matter of materials in which remedial work is often found necessary?
14. What are several good references dealing with remedial work in school?

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Chapter XVIII DRILL

Drill is one of the most widely used procedures in teaching in conventional schools. Its popularity among teachers is unquestionably due to the ease with which it can be applied. To many teachers, it is mere repetition of an act to attain perfection in a performance, irrespective of the needs and interests of children and the goal and standards of school achievement. This conception of drill is one of the chief causes for the many abuses and misuses of it in teaching facts, habits, and skills. Experimental practice furnishes objective evidence of the ineffectiveness of the drill procedure as formerly employed. This evidence has been helpful in many ways, but scientific research has not been entirely successful in devising materials and methods for effective administration of drill instruction so that it may be uniformly effective. Nor has it, as yet, adequately assembled the results of studies for classroom use. Nevertheless, much progress has been made in understanding the drill process and developing new principles governing its use by the classroom teacher.

The Nature and Necessity of Drill in Teaching and Learning. Drill is a serious work activity which has for its purpose the perfection of a skill or the strengthening of associations to make them more permanent. A synonym for the term is *practice*. Modern psychology insists that practice is most effective when the learner realizes the need for learning. The phenomenon of learning is quickly followed by the phenomenon of forgetting. The major characteristics of the curves of each have been plotted. If permanence in learning is desired, practice ordinarily is required. Ebbinghaus experimented with the learning of nonsense syllables in order to discover how

many repetitions were necessary before he could repeat a series of meaningless syllables without effort. Meumann and others experimented with meaningful material for the same purpose. Out of these and later experiments gradually emerged the so-called laws of learning. The laws of set, exercise, and effect are the major laws that govern learnings of various kinds.

Practical experience has also taught teachers that in learning such things as tables in arithmetic, dates in history, facts in geography, skill in handwriting, vocabulary in reading, and skill in drawing, gymnastics, and games, practice is necessary. There have resulted many devices and methods of drill and practice designed to make these learnings successful and permanent. Often, however, teachers have placed their main reliance upon the second of these laws; namely, the law of exercise, and have ignored the others to the everlasting harm of teaching and learning. Effective drill is economical drill or drill carried on with understanding, interest, and a realization that the specific exercises practiced are the ones the learner needs. Progress is necessary, and the learner must have assurance that he is making progress.

An illustration may be drawn from any game the reader prefers. Let us choose golf. This is a game requiring a high degree of motor coordination and skill. The learner must not only practice, but if he is to make progress he must practice with understanding and with a clear idea of his objective. Thousands of poor players whang a ball about for years without in the least improving their ability to play golf. This is because their practice is without understanding and direction. Let them, however, come into contact with a good teacher of golf. He analyzes their problems, sets up some fundamental principles, and starts them to practice on the basic elements of the golf swing. They begin to get some understanding; they begin to practice with a definite purpose and upon those elements that constitute good form in golf. In a few weeks or months, they begin to shoot an effective game. Gradually they improve and in a few months or a year they are skillful golfers. They are so successful in their game that they obtain greatly increased enjoyment from it.

So it is with learning other things. Practice, when necessary, centers on faults that need to be corrected. A child practices blindly on the forty-five addition combinations. Without intelligent action on the part of his teacher, he practices just as much on combina-

tions he knows as on those he does not know. His practice is unintelligent, nonpurposeful, and wasteful. Such practice is bad and defeats the very purpose for which it is used. Skilled direction by the teacher, however, soon discovers the combinations causing difficulty. These are singled out. Intelligent practice follows and results become satisfying.

How Drill May Become Effective. Drill should be intelligent and purposeful. The learner should understand just what it is that he is to learn, how he is to go about it, and how to correct errors when they appear. He should be in possession of a method of discovering his specific errors. He should have access to organized materials which help him diagnose difficulties and furnish him with economical and effective practice exercises. It is only in this way that he can save time and avoid needless effort. The only good drill is intelligent, individualized drill. Concert drills, so characteristic of the older school, are almost indefensible in modern practice.

Recent studies have shown that drill is most effective when it is on the whole process^{1, 2} rather than on isolated elements, and when it is distributed over a number of short periods instead of one long period. Common sense is in accord with these findings, and especially with the research studies which show the superiority of spaced drill over routine memory work on such tasks as are likely to bore children after the first few minutes of practice. Many teachers are aware of the lack of interest among children in learning routine things after the practice has been continued for some time. This condition is remedied in part by spacing drill periods and reducing their lengths from time to time during practice.

Research has also shown that, in planning distributed learning periods, consideration should be given to the kind of learning that is done immediately after each practice period. It is now rather common to have children engage in a different task or some unrelated activity after they have completed their practice work. The reason for this is that a similar task tends to interfere with previous learning.³

¹ Gates, et. al., *Educational Psychology*. New York: Macmillan Co., 1942. Pp. 380-86.

² Jensen, M. B., and Lemaire, A., "Ten Experiments on Whole and Part Learning," *Journal of Educational Psychology*, Vol. 28 (1937), pp. 37-54.

³ McGeoch, J., and McKinney, F., "Retroactive Inhibition in the Learning of Poetry," *American Journal of Psychology*, Vol. 46 (1934), pp. 19-30.

Common neglect of the laws of set and effect is an equally serious defect due to ignorance on the part of the teacher of the nature of the drill activities. Teachers can and do succeed, after a long time, in causing children to learn certain facts and skills by dint of unending drill. They do not realize that if care were taken to arouse an intelligent appreciation of the need for practice and the value of the skill or facts to be learned, so much practice would not be necessary. They are also unaware of the fact that constant failure, lack of progress, and inability to use the skill or facts intelligently are also responsible for ineffective results in drill. Good drill is intelligent, strongly motivated, and effective practice.

The Purpose of Drill Instruction. The purpose for which drill can be thoroughly justified, then, is to fix and to maintain a skill or a learned association that has meaning and is useful to the learner. There are other procedures which can be employed more advantageously than drill in gaining understanding of facts and information. It is a misuse of drill to employ it for purposes of developing understanding of a process or an operation without giving attention to the meaning of the process as a whole. Many teachers fail to understand the real function of drill, and as a result substitute it for other activities necessary to an understanding of the use of a skill or a fact in its natural setting. This misconception of the use of drill often arises from the fact that the teacher concentrates on the memorization of subject matter, not on its use nor on an understanding of it. It matters little, in the opinion of the teacher, how the subject matter is learned. In learning the combinations in arithmetic and in acquiring facts in history, teachers often emphasize the repetition of the facts apart from the total process and from their use and meaning, and fail to see that a fact or information will not function unless special attention is given to the purpose for which it is to be acquired. Likewise in learning the mechanics of punctuation, the spelling of common words, and dates in history, repetition is frequently given to the particular fact or item involved, without regard to the use of the fact and the attitude of the pupil toward it. This practice tends to develop the notion that drill can be effectively employed to fix and retain facts apart from their value and use.

What has just been said should not be construed to mean that the elemental units of a large reaction or operation do not belong to the realm of drill work. It will often be found necessary to drill

on these smaller units if the learner is having difficulty with them. For purposes of correcting specific errors in all types of reactions, drill plays an important rôle. In learning column addition, for instance, it may be found necessary to give specific drill on carrying, bridging the tens, and the holding of several numbers in mind as well as on the total sum of the column of numbers, but this drill should follow upon an understanding of the need for it by the learner. Drill should be reserved for the purposes of making automatic responses or reactions which have been found important in large unit activities. Facts and skills in history, processes and operations in arithmetic, principles in writing and composition, and skillful manipulation of the mechanics of language, reading, and the other fundamental subjects of the elementary school curriculum constitute the chief concern of drill in the modern sense of the word, but only in connection with an attempt to develop the larger meanings of the wholes to which these facts, skills, principles, and processes belong.

Drill and the School Subjects. The subject matter which demands drill for mastery is found more or less in all school subjects, but is characteristic particularly of the tool or service subjects. Arithmetic, reading, language, handwriting, and spelling, as organized, contain more material for practice than any other kind. These subjects have not as yet, except in an experimental way and in one or two commercial forms, been organized as activities. At the present time, an effort is being made to make them more natural and easier to acquire by organizing activities through which they are learned. In most schools, however, improvement in these subjects has taken place rather through trying to make them more interesting and satisfying than through intelligent practice.

Certain experimental schools have been making an attempt to reduce the drill aspects of these subjects to a minimum and to teach them through social studies. Incidental teaching is suggested by this method. Incidental practice, however, has not generally proved most successful. It seems more defensible to have a systematic practice or exercise period or periods for these subjects and to teach them specifically than to depend upon such incidental teaching as is shown to be necessary when they are met as tools in connection with some purposeful activity. At many schools where modified activities programs are in operation, these skill subjects are practiced specifically, but a careful record is kept in the

activities period of all uses of skills. Practice work is made individual and specific, and the periods devoted to reading, arithmetic, etc., are more effective because the need for practice is related directly to the use of the skills in purposeful activities of great moment to children. This seems to be an almost ideal way of handling the problem.

The subject matter of drill, then, consists of facts, principles, and skills of particular importance to the learner which may occur in any learning situation. These abound in tool subjects where they are often taught irrespective of their use in integrated situations. Isolated drill, however, is being attacked. When tool subjects are taught as subjects, without reference to their use in projects, the results are being greatly improved through better organization of drill materials, diagnosis, remedial exercises, and individual practice.

Drill and the Activity Curriculum. As has already been suggested, success in carrying on problems, projects, and unit activities depends upon the effectiveness of drill work. It is impossible to carry on these larger activities successfully unless the operations of the tool or key subjects—arithmetic, grammar, reading, and spelling—are developed. Nevertheless, these activities are the bases for the development of skills and motivate the learning of skills. However, the utilization of skills in connection with activities is not sufficient to establish control over them. An analysis of the tool subjects shows that mastery of much of their more difficult phases depends upon systematic drill exercises to fix habits of accuracy and speed of work. In arithmetic there are innumerable processes and operations which come under the category of skills to be made automatic by drill. Addition, subtraction, multiplication, and division of integers and fractions should be attentively repeated at intervals by pupils until they have developed a fair degree of accuracy and speed in using them. Writing exercises should be practiced until pupils have attained the standards for speed and quality set forth in one of the standard writing scales, such as the Ayres, Freeman, or Thorndike scale. Drill on the commonly misspelled words in sentences or in some instances even apart from sentences, should continue until pupils have built up a spelling vocabulary of at least 3,500 to 4,000 words by the time they have finished the elementary school course of study. Standards of attainment for practically all the elementary tool subjects are quite scientifically

determined, and comparative norms are available for checking the results obtained in these subjects. Much of this drill work should be individualized. All of it should be related, as far as possible, to the study of other school subjects where it is to be employed.

Two Ways to Make Drill Interesting. There are two ways to motivate drill: (1) by indirect methods, i. e., through discovery of a need for it in some meaningful activity, and (2) by direct methods, i. e., by specific attack on learning a skill without reference to any specific need. The former means of motivating drill is sometimes employed voluntarily when the learner finds it essential in understanding and applying a process or operation. The latter means of motivating drill is usually more common among teachers; drill is employed for its own sake, as it is believed to be interesting in itself. It may be said for the latter view that if drill is properly initiated and success is made possible, interest may not be a difficult matter to maintain. "Nothing succeeds like success." This motto holds that interest follows upon success. In other words, make success possible and interest will take care of itself. Also give the learner a clear view of his goal and interest is likely to follow. The learner must know what he is attempting to do at all times. Otherwise he will lose the interest that he may have, and if he does not have it, he probably never will develop it.

The Intrinsic Method. This, however, does not settle the question as to what is the best way of motivating drill. On theoretical grounds the intrinsic method appears sounder. Specific need for a skill as revealed in an activity is, or should be, a natural cause for strong interest in it.

The fact that children may become interested in drill through establishment of need and success in learning should not, of course, obscure the fundamental principle that drill cannot be justified unless it develops understanding and insight into the need for the processes as well as proficiency in their use. Ideally, practice should follow on a need for it, but the lack of well-organized practice will be a cause of poor results. It seems more defensible to draw ideas from both factions and to motivate drill through activities first, then to follow this by effective motivated practice.

Motivated Practice. Effective practice may be insured by observing the following principles: The character of the initial practice conditions interest. If the practice exercises are relatively easy in the early stages of learning a process or operation, interest is ordinarily

forthcoming. If they are not, interest will be difficult to arouse. It is sound practice, then, to begin drill work with easy exercises and gradually increase them in difficulty as general improvement is made by the group. It is also very essential that the learner know whether or not he is making progress. Frequent testing, therefore, is necessary and beneficial to subsequent practice. Making children aware of the results of achievement arouses a strong urge among them to improve. This can be done in several ways. If objective tests are used, the teacher may present the results of these tests in the form of a chart or graph or both, or he may teach the children to make charts and graphs of their learning progress. The latter method is more stimulating to children. Another method of motivation is to set up a miniature experiment in the classroom and try out different motivating devices for drill. Measurement of the results of different devices may show some of particular value. Book ⁴ showed that when the learner is aware of the results of practice, the work is much more interesting and effective. When children themselves see that certain forms of practice are highly effective, their efforts should be greatly improved.

There are several experimental studies which reveal the value of motivated drill. In one of these investigations,⁵ it was found that when rivalry was employed among children of the fourth and sixth grades they improved their achievement in solving arithmetic problems. The data of Table 5 are proof of this fact.

TABLE 5. Scores Made on Addition Tests by Control and Rivalry Groups

DAY	GROUPS	
	Control	Rivalry
First	7.43	7.24
Second	8.12	11.00
Third	8.19	11.26
Fourth	7.99	11.17
Fifth	8.06	11.39

In this particular experiment the control group was urged to try as hard as possible. The rival group which was composed of two competitive sections had their scores written on the blackboard and announced to them orally. They made most of their gains at

⁴ Book, W. F., *Pedagogical Seminary*, Vol. 29 (Dec., 1922).

⁵ Hurlock, Elizabeth B., "The Use of Group Rivalry as an Incentive," *Journal of Abnormal and Social Psychology*, Vol. 22 (1927), pp. 278-90. (Used by permission of the author.)

the beginning of the experiment and showed little or no improvement thereafter. This would indicate that they had apparently reached the level of their achievement at the start. The younger children improved their scores more than the older ones, and the less capable responded better to rivalry than the average and the more capable pupils.

The graphs in Figure 1 also reveal the value of employing incentives in learning. The results are for equated groups of grade-

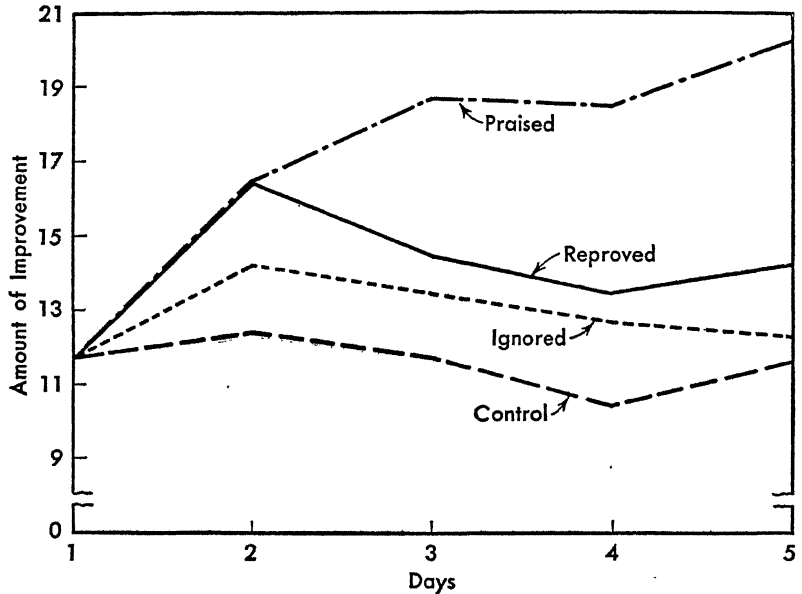


Figure 1. The influence of incentives on the ability of children in fourth and sixth grades to add three-place numbers. (Practice periods were 15 minutes. Data from Hurlock.)

school children in adding numbers. The control group worked by itself. The other groups were praised, reprovved, and ignored at appropriate periods in the same classroom and always in the presence of each other.

It will be noted that the control group made no gains, remaining virtually on the level at which the pupils began their work. The ignored group showed little improvement at first, but the influence of hearing the other two groups praised and scolded each day apparently became detrimental to its improvement. Oddly

enough, both the praised and reproved groups made about equal gains on the first day. However, the reproved group soon showed a decline in improvement as the result of continued scolding. The praised group, on the other hand, continued to improve gradually after the initial learning period. Obviously any incentive which is overworked will wear out. The teacher must be the judge of the value of motivating devices and techniques.

Drill in Arithmetic Illustrated. A specific illustration will help to make clear how drill work in arithmetic may be motivated. Suppose the exercise of adding a column of numbers, having for its aim the ability to hold the sum of several numbers in mind, is the operation to be performed by the group. The teacher may employ any one of the following means of motivating the work: (1) gauging the exercises to the abilities of the group, making possible immediate success; (2) comparing the number of exercises added by a learner in a given length of time—say five minutes—with the average of the group for the same period of time; (3) giving pupils their records of the previous day's performance and having them try to excel them today; (4) putting a chart or graph on the blackboard, showing the average improvement in adding for individual members and the class from day to day; (5) having children keep individual and class graphs for purposes of comparison with their own individual and class performances; and (6) preparing for a contest if there are several divisions of the same grade in the same building. These represent a few of the motivating devices which have been used by more competent teachers. It is true that many of them are extrinsic to the real use of numbers in life but they are at least more effective than older devices. Others may be added to the list, for it is far from being complete. There is probably no single means of motivation so strong as the one of insuring pupils an opportunity to succeed and showing them that they have succeeded. Children, as well as adults, like to do those things in which they are successful. Schoolwork should be so organized that success is made possible.

Directing Practice in Drill. In drill work, if independent work is to be done by the pupil, and it must be done either in school or out, the assignment is a particularly important matter. Time will be lost and results will be poor if teachers fail to direct the pupil adequately. He must know specifically what he is to practice, how he is to practice it, and how he can tell whether or not he is making

satisfactory progress. This calls for skilled assignment. Fortunately in some subjects, particularly in arithmetic and spelling, excellently organized materials, including drill exercises adapted to individualized instruction, are available for this purpose.

Good assignment techniques may be illustrated by drawing material from the subject of arithmetic, which is usually considered the example par excellence of the tool subjects. There is probably no other school subject in which drill material is any better organized. This makes it possible for the teacher to give excellent assignments if he does not leave the matter entirely to the materials and say simply, "Take the next ten exercises or problems." Such an assignment is never defensible unless pupils have previously discussed the work involved, understand its importance, know what is to be done, and know how to do it. In the latter case, it might be justified.

If textbook examples of type problems and processes are previously illustrated or demonstrated by the teacher, or if the assignment merely consists of practicing some familiar process or operation, a general statement of what is to be done in the way of preparation for a subsequent meeting of the class may be made with justice to all concerned. However, as a rule, short assignments are usually very ineffective unless preceded or accompanied by some motivating device. In the more modern textbooks in arithmetic, these devices are plentiful. They are also to be found plentifully in practice books for seatwork. The textbooks give excellent explanations of processes. The workbooks give effectively organized specific exercises. Assignment consists then in a clear explanation of the purpose of the material. The pupils undertake to practice. Self-checking tests, graphs, charts, and rating cards make the checking of progress simple and add to the interest. The secret of making an effective assignment is learning how to set up the problem at the beginning. If the proper sort of orientation is provided in the beginning of new work, pupils will have little trouble, in general, with their preparation out of class. It is dangerous, however, to expect pupils to learn new operations from textbooks or workbooks alone, for they do too much fumbling and waste a great deal of time and effort in trial-and-error learning. New processes should be developed with pupils in class. They should know what they are to practice and feel a need for it before being permitted to under-

take an important activity unaided. Ineffective habits, once established, are difficult to eradicate.

Home Assignments. Homework should make application of what is learned in the classroom. The assignments should be made with a clear understanding of their difficulty and the time which children have at their disposal to prepare them adequately. All written work done at home should be checked in class and a record of it kept from day to day to show pupils at a glance, their progress. Obviously, not all homework by the children should be of the written type. Some of it, in fact, much of it can be prepared orally by them. But all homework should be within the children's ability to make reasonable progress in preparing it.

A great deal of care must be exercised by the teacher in making out-of-class assignments, for if he assigns work on new processes or operations without first giving instruction on them in class, the children will have to rely on the explanations of their parents or of someone else who is not especially trained to give effective assistance.

Class Activities in Drill Instruction. Common recitation activities in drill work include explanations, preliminary practice, assignment of drill exercises, correction of drills, analysis of errors, discussion of difficulties, and remedial work to be undertaken to correct them. In drill work, the recitation period is ordinarily a work and conference period. However, it is becoming more and more common to use the period for directed study and individual work.

In connection with more difficult types of learning, such as are involved in arithmetic, considerable explanation by the teacher is necessary to make it possible for the child to understand the process. Initiating correct performance is necessary. Commonly the first attempts of the pupils to learn the process are rightly made under the personal direction of the teacher in the recitation. He demonstrates the method, shows children how to carry on a performance, and then lets them try it under his direction, observing errors and showing pupils how to correct them.

After the pupils have succeeded in understanding what is to be done and have had some preliminary practice, the teacher assigns additional practice material. The pupils may then continue the practice under his immediate direction, or independently either at school or at home. If the practice is carried on at school, the teacher

will inspect their work from time to time to see what they are doing and how well they are doing it and to offer suggestions and help when needed.

Ultimately, an appraisal of progress, analysis of difficulties, and suggestion of remedial measures will need to be made. The recitation may at times be devoted entirely to matters of this type. Pupils will have questions that they wish to ask. The meaning and use of the process will need to be further discussed and its value further estimated.

Principles of Practice in Learning Mental Skills. When practice is carried on under the teacher's direction in the recitation, there are certain principles governing effective practice of which he should be master. These will be briefly discussed in the following paragraph for the purpose of showing how the teacher's knowledge of such principles functions in improving the pupils' activities.

In order that drill may be made an effective instrument in learning, it is necessary that the learner adhere strictly to certain well-established guiding principles. He must not only know what the performance is but he must also know how he is to perform. Proper orientation from the very beginning is essential. Clear models showing the nature of the performance are valuable aids in getting properly oriented. Careful observation of movements, as well as practice in making those reactions which will be used later, are also important guiding principles in the correct formation of habits and skills. Gates⁶ gives the most comprehensive list of principles of guidance in the acquisition of information that may be found anywhere in print. They are applicable to the learning of mental skills and are abbreviated here for study.

1. One learns just those reactions which he practices.
2. The form of presentation which is mechanically most convenient should be utilized.
3. One should practice the reaction which will be demanded later in life.
4. Formal exercises, crutches, and other mnemonic devices should be used sparingly and never unless some special reason for them exists.
5. One should try to detect errors by testing ability to recall, and avoid practicing wrong reactions.
6. Guidance should be given to the learner in such a manner that he will not only learn and use facts, but also learn how to learn and use them.

⁶ Gates, A. I., *et. al.*, *Educational Psychology*, revised edition. New York: Macmillan Co., 1942. Pp. 349-63.

7. When recall is blocked, search for clues, and if these fail, drop the practice for the time being before trying again.

If these principles were adhered to more strictly in the beginning stages of learning, there would be little need for drill as remedial work; but remedial practice is one of the commonest uses made of drill in teaching. Its popularity for corrective work has become so great in recent years that it is necessary to set up a general procedure for its use. Usually some form of diagnosis is necessary to detect the awkward or wrong reaction. This may be best accomplished either by careful observation of the activity or by using an objective test before teaching. When the wrong reaction is once revealed, it is important that the learner be made conscious of his mistakes. He should be taught to find his own weaknesses, rather than be shown them by his teacher. This practice develops a desire on the part of the learner to make only correct responses and to give as little use as possible to the wrong reactions. In other words, the learner becomes alert about what he is doing, and therefore makes fewer mistakes than he would otherwise make. It is then the teacher's duty to provide opportunities for making the correct reaction possible at the least cost of time and effort to the learner.

In the majority of instances, drill should be largely an individual matter with each member of the class. It rarely happens that the entire class needs to practice on the same exercise, for all members seldom have the same difficulty. In the past, it may be recalled that teachers spent a great deal of time with the class in concert drill. Recent studies indicate that such practice is wasteful and uneconomical when an appraisal of children's difficulties is not made beforehand. Its use is very limited in most schoolwork.

Standards for Drill Instruction. Studies dealing with the nature and use of drill in the key subjects suggest that certain standards be observed in drilling. They are briefly summarized below:

1. For speed and accuracy provide drill on actual responses that function in life.
2. Provide opportunities for special practice on difficult phases of skills.
3. Make the practice periods relatively short, about ten or fifteen minutes in length.
4. Have the intervals between practices gradually increase in length until the skill is perfected.
5. Specify practice according to the needs of the learner.

6. Use crutches with care, for they may hinder progress more than they assist in perfecting the skill.
7. Provide standards of attainment for the class, and have each individual try to reach them.
8. Use many different kinds of exercises to stimulate activity, for drill easily becomes monotonous.

Checking the Effect of Drill. The mastery of knowledge, a habit, or a skill of any kind, whether it be connected with a mental or a physical activity, is best shown in the use which the learner makes of it. Some skills lend themselves to appraisal by observation, viz., ability to throw a ball, or ability to use correct oral language. Others may best be measured objectively. Practically all kinds of objective tests and drill materials may be used in one way or another to check on mental skills. Among the most important of these are the practice materials in arithmetic, such as those of Knight and Lennes, and others of a similar nature. These tests are valuable for diagnosis to a certain extent also, but their use in this respect is somewhat limited in the classroom. The teacher will often find it necessary to devise his own tests for diagnostic and remedial purposes; sometimes also practice exercises must be devised to provide special drill to correct individual difficulties. Pupils may evaluate their own progress in drill by the use of a check list such as the following:

A CHECK LIST FOR GUIDANCE IN LEARNING A MENTAL SKILL

Directions. Encircle "YES" if you were aware of or observed a certain principle in the development of the mental skill; encircle "NO" if you were not aware of or did not observe such a principle.

- | | | |
|--|-----|----|
| 1. Did you observe a model in the early stages of the development of the skill? | YES | NO |
| 2. Were you given a demonstration or an illustration of the kind of performance which you were to learn? | YES | NO |
| 3. Could you follow the model easily? | YES | NO |
| 4. Did you react definitely to the model or situation? | YES | NO |
| 5. Did you just "pick up" the skill? | YES | NO |
| 6. Were you of the opinion that a skill would function without regard to the way in which it was acquired? | YES | NO |
| 7. Did you know that you learned precisely the reaction which you will be called upon later to make? | YES | NO |
| 8. Did you learn the skill as a big unit? | YES | NO |
| 9. Did you learn it in parts? | YES | NO |
| 10. Did you know that the part method of learning a skill introduced misleading connections? | YES | NO |

- | | | |
|--|-----|----|
| 11. Did you know that a few skills, such as learning the multiplication combinations, should not be learned in serial order? | YES | NO |
| 12. Did you learn the skill by actually practicing it? | YES | NO |
| 13. Did you employ formal exercises, such as crutches or mnemonic devices, in learning the skill? | YES | NO |
| 14. Were you aware of the fact that crutches usually add something to be learned in addition to the skill? | YES | NO |
| 15. Were you aware of practicing any errors? | YES | NO |
| 16. Did you try to detect errors in your learning of the skill? | YES | NO |
| 17. Did you lose control of the skill at any time? | YES | NO |
| 18. Did you observe any clues to try to get control of the skill? | YES | NO |
| 19. Did you know when you had mastered the skill? | YES | NO |
| 20. Did you apply it to an actual situation to see if it would "work"? | YES | NO |

The Outcomes of Drill. Drill is to be used not merely for purposes of developing knowledge and skill. It is vitally important as a means of maintaining good habits when they are once established. In other words, drill is essential, first in fixing the reaction or habit, and then in making it a smooth-running unit of behavior. A habit is made possible through some practice; skill is the correct use of the habit. The outcomes of drill, then, are to be found in increased command of tools, increased knowledge, and better habits of work. Knowledge of the combinations in arithmetic, ability to spell words correctly, good handwriting habits, and effective handwriting—these are important. But perhaps more important, in the last analysis, is the ability to use drill intelligently when needed; to know how to drill effectively and to know when practice is sufficient and has accomplished its purpose. Intelligent drill saves time. Unintelligent drill is wasteful and purposeless. Elimination of waste in learning should result from effective drill.

STUDY QUESTIONS

1. What is the significance of the statement that one learns just what he practices?
2. Why is it an advantage to the teacher to understand that it is the reaction and not the subject matter that is learned?
3. What is the distinction between a habit and a skill? Illustrate with specific examples.
4. Why is it impossible to develop a skill before the habit is established?
5. What is the value of models in learning a skill?
6. What are the main characteristics of effective models?
7. Why is remedial work often necessary in learning mental and motor reactions?

8. What subjects usually require a great deal of remedial drill? Why?
9. What is a specific instance of motivating drill through discovery of a need for it in some meaningful activity?
10. What is the nature of the evidence which supports direct systematic drill over incidental drill?
11. What factors will condition the assignment for practicing a reaction out of class?
12. What devices may be used advantageously in stimulating drill activities?
13. What guiding principles should be kept in mind in conducting remedial drill work?
14. What is the value of a check list in developing a mental skill?
15. What is the value of the following factors in drill:
 - a. Mnemonic devices
 - b. Length of practice periods
 - c. Intervals between practices
 - d. Standards of attainment
 - e. Diagnostic tests
 - f. Time limits

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Chapter XIX THE REVIEW

The review is a time-honored technique used by teachers in conventional schools to obtain permanence in learning. It is based upon the need for practice or exercise as established by experiments in the study of forgetting. That it has been popular is obvious, for it has been employed universally as a means of mastering those fundamental facts and skills which were believed essential in school and life; but it would not be an exaggeration to say that no activity has been worse abused than the so-called review lesson. The review has been a godsend to many subject-matter teachers, for without it they would have been entirely at a loss to know what to do to keep themselves busy on many an unplanned day. Experience and experimentation in recent years have furnished considerable evidence of the ineffectiveness of former practices of reviewing, and have revealed the effectiveness of modern practices. Sound ideas concerning the purpose and use of the review technique are necessary for effective teaching.

A Definition. A review consists of a recall of experiences already past. To review means literally to "view again." A review is not a review until one has already learned a new system of facts or has completed an experience; for up to this particular stage the learning involved is of the developmental type. It is concerned with new experience and with the establishment of new associations, the development of new skills, or the solving of new problems. The review, on the other hand, involves a recall or review for purposes of renewing the learning already passed and of carrying it on to mastery. A review aims at the mastery of facts and skills; it differs

from drill in that what is desired is not mere repetition of facts and skills in the form in which they were originally learned, but rather the introduction of new elements and the reorganization of thought as well.

Review and Drill Differentiated. There is much confusion in the minds of many concerning the difference in meaning between review and drill. These two types of learning are not always identical in character, although they may appear to be alike in function. The best kind of review is properly the reorganization and integration of experiences. It is seeing facts in new relationships. It is a new view of previously learned facts and skills and not the mere rehearsal of them in the same identical way. An illustration will help to make this point of view clear. If a student learns history dates in a logical order through establishing associations with the events to which they properly belong, a review of these dates by making proper associations with the lives of noted historical characters is superior to a repetitive drill on the original pattern. If, at first, a student learns the content of printed pages by finding answers to questions, a good review of these pages consists of making a summary or an outline of them. The point is that one should not review the same material each time in the same way, for nothing new accrues from the practice. A review is a reworking of the material from a different point of view, while drill is the activity involved in repeating data or behavior during the first learning. Thus a review is a broader and more inclusive term.

A New View of Review. The review is commonly employed for purposes of preparing for an examination, of mastering facts and skills, of making up deficiencies in learning, or of appraising habits of study. However, these functions may be classed as the less important uses of the review, for it is questionable whether or not reviewing is the most effective means of reaching these goals. Certainly no progressive supervisor would ask his teachers to spend a great deal of time in merely preparing a class for an examination. If there is an unworthy aim of the review, this is one. Most reviewing should be employed for purposes of getting pupils to see facts in new relationships and thus enrich experience. This practice involves the reorganization and reintegration of their experiences, aiming at new products. Naturally, the process of reorganizing one's experiences aids in fixing facts and information in mind. In fact, all the other functions of the review can be indirectly attained

through the process of reorganization and integration of facts, information, and skills in the light of new experiences.

Helpful Suggestions for Review. Crawford¹ gives a rather complete list of suggestions on reviewing, including specific hints as to methods to be followed. Some of these are reproduced here, for the most part verbatim.

1. Review for other purposes than getting good grades.
2. Review in the way you are to be tested.
3. Have the review involve new learning.
4. Direct the review in some measure to the places where you are weakest.
5. Make the review original thinking, as well as assimilation of the thoughts of others.
6. Review to establish coherence and continuity between parts of the course.
7. Review by organizing previous knowledge.
8. Make the review in part a process of checking and verification.
9. Let the review procedure and study procedure be different.
10. Review the subject, using a different classification from that by which it was originally studied.
11. Review both as to pattern and as to the separate threads.
12. Review for main points rather than for details.
13. Review by condensing what you know.
14. Review by making an outline of the course.
15. Review by solving problems which involve the material treated in the course.
16. Use the chapter exercises in the textbook for reviewing.
17. Use review questions as guides when they are available.
18. Review for definite purposes.
19. Test yourself as you review.
20. Facilitate review by means of the original method of studying.
21. Review by taking advanced courses in the same field.
22. Employ review methods which involve visualization.
23. Review by means of previous notes.
24. Employ group reviewing with discretion.
25. Review by consulting new sources.
26. Review both at short and at long intervals.

These suggestions are not ranked or weighted in order of their significance. They are suggestive of more effective ways of conducting reviews. Their greatest importance to the teacher and pupils will be found in the detailed and tangible manner in which they

¹ Crawford, C. C., *The Technique of Study*. Boston: Houghton Mifflin Co., 1928. Pp. 253-67.

are presented. The reader may add other suggestions to the list if he chooses to do so, for it is not all-inclusive.

Review Useful in Many Situations. Reviews have been common in all subjects but perhaps much more common in the tool subjects than in others. Wherever important facts or skills have been involved, review has been thought a necessary procedure. More intelligent use of the review is now becoming common. It is now understood that subjects taught through activities and units require use of the review technique; that difficult aspects of the content subjects, such as are found in geography, history, and science, in which the modern trend is to establish large units of study, demand carefully organized review; and that new approaches are often the most interesting and effective means of reviewing subject matter.

A typical illustration of how the review may be satisfactorily and effectively carried on in history by changing the original attack will aid the reader in understanding the value of review of large units. Suppose the class has been studying history in a logical manner by periods. The essential events, such as political parties, great leaders, the tariff, manufacturing, transportation, and the like, of each historical period are carefully associated with the period to which they properly belong, irrespective of their relationship to other periods. This is a logical method of teaching the events. In reviewing these events, the teacher may use the problem approach and treat each of the previous topics as a major problem running as a continuous thread throughout all historical periods. Each major problem may be studied in its relation to the others; it may be broken up into minor problems and each of these considered in order. This forces a reorganization of subject matter and development of new understandings. The tariff, transportation, and other historical problems may be treated in their relation to all periods and epochs of mankind. This method, though suggested here as a way of reviewing, is the psychological method of teaching the events of history, and it is gaining considerable favor among progressive teachers as the best method to use in the initial approach to the subject.

The review is an essential feature of the unit of work procedure and of other modern procedures in different fields. A number of these will be briefly discussed, calling the attention of the reader to the particular phase of the plan or technique in which the review constitutes an important aspect of the work.

The weekly unit plan of teaching spelling involves reviewing as an important aspect of the process of pretesting, studying, and retesting. The test study plan begins on Monday with testing a group of pupils on a given number of words; it continues with studying on Tuesday, testing and reviewing on Wednesday, studying again on Thursday, and finally testing and further reviewing on Friday. The study-test plan omits the initial Monday test and puts more emphasis upon presentation of the weekly test. Subsequently additional reviews of important words are provided for in both plans. The Morrison mastery technique² begins with pretesting the pupils' knowledge of a given unit of material. This practice is followed by teaching and retesting, in order. Then the formula is continued by adapting the procedure and final testing for mastery of the unit. In the Morrison Plan, reviewing becomes an essential aspect during the fourth and fifth steps in which the procedure is adapted to the newly discovered conditions and the final testing is effected. The Dalton Laboratory Plan³ also makes considerable use of the review in attaining mastery of an assignment or contract, since about 95 per cent mastery is demanded of the pupil under this plan, especially if the pupil, upon taking the final test, shows only moderate success. Other unit planning schemes, such as the problem, project, unit, job, and the like, involve the review technique to a large extent to insure mastery. A good summary and review are generally necessary before conclusions are reached in any type of reflected thinking that embraces the handling of data of a detailed nature. Common practice associates reviews with difficult ideas and extended experiences.

Making Reviews Interesting. The review may be a very uninteresting affair if it is conducted solely as drill by merely repeating materials over and over in exactly the same way each time. Incidentally, this practice may be regarded as the chief reason why reviewing has commonly been undertaken by pupils in a half-hearted, passive manner. A well-organized review, involving a new way of handling materials, should be a sufficient stimulus in itself to get children interested in the activity. If, for instance, the first attack has been directed to problems and their solution, an

² Morrison, H., *The Practice of Teaching in the Secondary School*, revised. Chicago: University of Chicago Press, 1931. Pp. 89-103.

³ Parkhurst, Helen, *Twenty-fourth Yearbook*, National Society for the Study of Education, Part II. Bloomington, Ill.: Public School Publishing Co. 1925. Pp. 84-94.

interesting review may be in the form of preparation of a report or outline of the work covered, a summary, a graph, a statistical table, or some other condensed and graphical form. It should be the teacher's duty to see to it that new and interesting experiences are provided from time to time, to cause children to attack their reviews in a different manner. Unless the teacher is quite resourceful in this respect, he will probably have to resort to games and contests to stimulate interest. These are, however, less desirable than an intrinsic interest in the review itself.

Assigning Independent Work. In most cases, the assignment for the review is similar to that for other methods of teaching and learning. One precaution must be observed, and that is, the assignment generally should call for a reorganization of materials previously studied; that is to say, preparation of the lesson should not be a mere repetition of the materials. The preparation should involve new organization of facts and information. Otherwise the review becomes formal drill.

Some suggestions are indicated here on possible ways of making the assignment for the review. A number of factors, however, should be kept in mind in employing any one of these suggestions. Among these may be mentioned keeping the assignment within the range of ability of the class, stating clearly what is to be done and how well it is to be done, and suggesting a plan of procedure different from that employed in previous study. Among the numerous types of assignments, the following are probably most effective for the review:

1. To make a summary of the materials originally studied
2. To evaluate materials
3. To answer questions about materials
4. To work out multiple-response exercises
5. To outline the work previously covered
6. To write out questions from materials
7. To prepare reports to give in class
8. To make charts, graphs, maps, statistical tables, and pictures
9. To plan and organize activities.

The pictorial method of reviewing materials is very effective in crystallizing facts. A graph, chart, or statistical table will demand considerable reflective thinking in condensing and arranging the data of printed pages in tabular form. It possesses the added advantage of displaying results in a graphic manner to pupils.

Effective Class Activities. The activities of the class period during review may consist of oral discussion, outlining, summarizing, making graphs, maps, or statistical tables, or of explanations by the teacher to clarify certain points that may not have been understood in the first study of the subject. In any case, the recitation should contain new elements and proceed in a different manner from the original period in which the data were learned. The important thing is not to make the procedure a mere deadening repetition of the original experience. A common procedure is to question pupils on what they have previously learned, to point out their errors and to supplement the original presentation. This type of review is still good under some conditions; but theorists in general advocate that the review shall be a reworking of the material from a different point of view.

Some of the typical activities of a better type of review procedure call for the reorganization of the original data, such as making a topical outline or summary, underlining important elements in the original material, making marginal notes, paraphrasing, composing from direct observation of objects, persons, events, etc., making a chart, a graph, a statistical table, an outline map, a scrap notebook, a memorandum, and the like. For the convenience of the reader a list of review activities appropriate for the recitation is suggested below. If any one of these has been employed in previous study or recitation, the others would be desirable for reviewing.

1. Note the chapter and paragraph headings in books.
2. Study the summaries of sections, chapters, and parts of books.
3. Observe first and last sentences of paragraphs.
4. Underline important facts in paragraphs.
5. Make marginal notes in the book if it is your own.
6. Answer the study questions.
7. Read the annotated references if given or read a few of the selected references.
8. Make a bibliography of your own.
9. Outline the paragraphs and chapters of the book.
10. Summarize or condense what you read.
11. Paraphrase poetry.
12. Make an anthology.
13. Make out sets of test questions.
14. Make a collection of articles, objects, specimens, etc.
15. Write out your observations.
16. Recite to yourself.

17. Make a scrapbook.
18. Make a chart.
19. Make a graph.
20. Make a statistical table.
21. Make an outline map.

Not all of these activities are applicable to a given unit of material. For instance, it may not be possible to make a chart, a graph, or a statistical table from data of certain kinds, whereas a summary, a picture, a set of questions, or an outline may be readily adapted to them. This is a matter to be determined largely by the pupil and teacher when they attempt to review materials.

One writer ⁴ suggests that the pupil be taught to review in the way he is to be tested. This does not imply that he will merely cram for an examination, but instead that he will prepare himself by well-distributed reviews to respond in the manner in which he will later be called upon to respond. For example, if the examination is to be a multiple-response type, the recitation or study should contain some multiple-response exercises; or if the examination is to be a report or an essay, the appropriate recitation activity suggested is organization and discussion. The preparation of pupils solely for an examination is, however, by no means the chief function of the review recitation. It is important only to the extent that the school makes the practice necessary. In schools where examinations are less stressed, reviews may take any form that seems appropriate.

Distribution of Reviews. There are some facts, information, and principles which are important enough to be retained over a period of time. In order to make certain that too much forgetting does not take place after the acquisition of such knowledge, the teacher should make provision for systematic reviews. The first period of review or practice should come after a very brief lapse of time. Then others should follow in such order that each succeeding one is progressively shorter than the previous period. For example, if the first practice period is fifteen minutes, the next one might be eight minutes, the next five minutes, and the last one might be two minutes. According to one investigator,⁵ this distribution of

⁴ Crawford, C. C., *The Technique of Study*, Boston, Houghton Mifflin, 1928. Pp. 253-62.

⁵ Clark B. E., "Effect upon Retention of Varying Lengths of Study Periods and Rest Intervals in Distributed Learning," *Journal of Educational Psychology*, Vol. 19 (1928), pp. 552-59.

See also Sones, A. M., and Stroud, J. B., "Review, with Special Reference to

time for practice is much more effective than that of dividing the thirty minutes into four periods of seven and one-half minutes each.

The time intervals between reviews should be increased progressively. For example, if the first interval is one day, the next should be two days; the third one, four days; the fourth, eight days; and so on. A distribution of approximately double the pre-

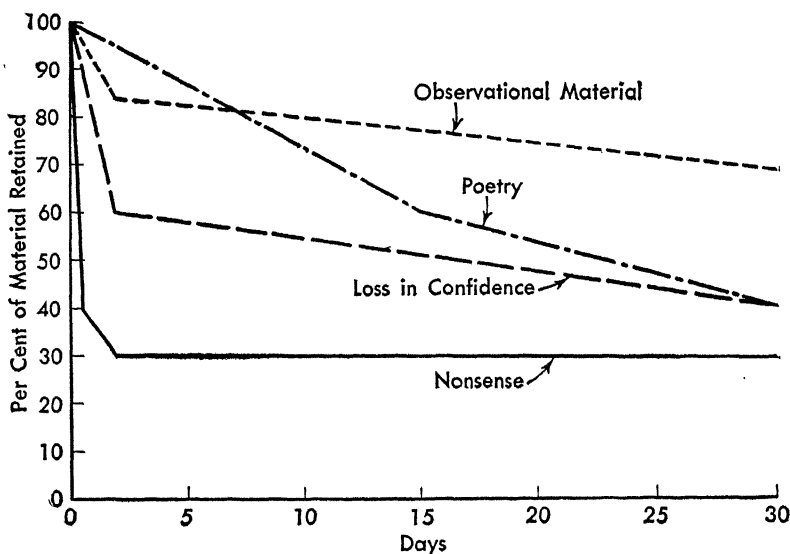


Figure 2. Typical rates of forgetting for different kinds of material. (From A. R. Gilliland, "The Rate of Forgetting" *Journal of Educational Psychology*, Vol. 39, 1948, p. 23.)

vious interval is quite satisfactory. If the interval between reviews is too long, the learner will find that forgetting may become so great that considerable relearning will be necessary. The intervals between reviews should be so distributed as to reduce to a minimum the necessity of relearning. In general, the interval between reviews should increase in length as the length of the practice periods decrease. They are inversely related to each other.

The need of review, if factual material is to be retained for any length of time, is indicated clearly by Figure 2. Unless reviews are distributed at optimal intervals, it is obvious that facts will be
Temporal Position," *Journal of Educational Psychology*, Vol. 31 (1940), pp. 665-76.

quickly forgotten. The curve in Figure 2 is fairly typical of retention of different kinds of material.

Some pupils forget rapidly and others not so rapidly. The rate differs for different pupils and with the same pupil at different times and for different kinds of material.

In the study referred to in Figure 2, the author shows that the loss of confidence in ability to retain what is learned is much more rapid than the loss in recall of facts. There was a loss of 40 per cent in confidence after 48 hours for one group, and 60 per cent loss for another. After one week there was a loss of 60 per cent with one of the experimental groups and after one month 75 per cent for the other.

Appraisal of the Effectiveness of Reviews. The results of a review are commonly measured by some type of test. The essay test is older and probably most common, but the new-type objective tests are also useful since they permit a better sampling of the original data than the essay test. The writers advocate the use of both types of tests. The essay test measures the child's power in organizing and expressing ideas. The objective test samples knowledge more widely and tests the child's power to recall and evaluate data. Oral testing of knowledge gained by review is still rightly employed under certain circumstances.

The making of an outline, a written summary, a map, a chart, or a graph, or the exercise of a skill under observation, are also good tests of the effectiveness of review.

In a review test the teacher should be sure to include some items which test the new viewpoint developed by the review. Otherwise some values may be lost which have been a part of the review activity.

The effectiveness of review is often measured by a repetition of original tests and by comparison of scores made upon these tests. The gain which may be attributed to the review, or the maintenance or skill shown by the comparative scores on both tests, is objective evidence of the effectiveness of reviewing.

Unnecessary reviewing may often be prevented by the simple expedient of repeating tests at intervals. The repetition of the test may be all that is necessary in order to maintain a skill at its proper stage of effectiveness. Sufficient time should elapse between the repeated use of tests to prevent memorization of test items without understanding of facts and principles.

The Outcomes of the Review. The outcomes of review may be good or bad, depending on the method by which the review is conducted. If a review is nothing more than mere repetition, it does not achieve its highest purpose. If, however, it adds new insight and understanding, recalls and fixes facts, and perfects skills, it is a valuable experience. As long as examinations are given and used as a means of determining grades, the review will be important as preparation for them. If the nature of examinations should change, then changes in methods of review will follow. A good review achieves its purposes, whatever they may be.

STUDY QUESTIONS

1. What have been some of the many uses made of the review?
2. How does the review differ from drill?
3. How may the review be used to reorganize experiences?
4. What is the value of problems and projects in reviewing?
5. How does the Morrison mastery technique make use of the review?
6. What is the advantage of reviewing in the way one is to be examined?
7. How may the graph, the chart, or the table be used in reviewing?
8. What is the objection to reviewing for an examination?
9. What is a good principle to follow in conducting a review?
10. Why should the review not be used for remedial purposes?
11. If pupils originally studied or learned a certain unit of material by asking or answering questions about it, how may the assignment be made for effectively reviewing it?

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3. ———. *The Guidance of Learning Activities*. New York: D. Appleton-Century Co., 1944. Pp. 403-4.
Makes important distinction between drill and review.
4. CRAWFORD, C. C. *The Technique of Study*. Boston: Houghton Mifflin Co., 1928. Pp. 253-71.
Gives a list of guiding principles for reviewing.
5. DOUGLASS, H. R. *Modern Methods in High School Teaching*. Boston: Houghton Mifflin Co., 1926. Pp. 61-66.
Discusses the purposes of the review and gives several types of reviews with their techniques.

6. GATES, A. I.; JERSILD, A. T.; MC CONNELL, T. R.; AND CHALLMAN, R. C. *Educational Psychology*. New York: Macmillan Co., 1942. Pp. 377-423.
Discusses the principles of guidance in the acquisition of verbal abilities.
7. GILLILAND, A. R. "The Rate of Forgetting," *Journal of Educational Psychology*, Vol. 39 (1948). Pp. 19-26.
Contains experimental data on typical rates of forgetting for different kinds of materials.
8. PRESSEY, S. L., AND ROBINSON, FRANCIS P. *Psychology and the New Education*. New York: Harper & Bros., 1944. Pp. 560-63.
Discusses the value of the recitation and review and the strategic spacing of reviews.
9. RISK, T. M. *Principles and Practices of Teaching in Secondary Schools*. New York: American Book Co., 1941. Pp. 386-90.
Discusses the nature and purposes of reviews, how to plan the reviews, and their relation to other activities.
10. STROUD, J. B. *Psychology in Education*. New York: Longmans, Green & Co., 1946. Pp. 517-26.
Contains a discussion of the objectives of the review, methods of implementing it, and a recommendation on when to review.
11. YOAKAM, G. A., AND SIMPSON, R. G. *Directed Study and Observation of Teaching*. New York: Macmillan Co., 1934. (Revision in preparation.)
Contains related exercises.

Chapter XX THE APPRAISAL OF PUPIL PROGRESS

One of the oldest functions of the teacher is that of appraising the progress of his pupils. Methods of appraisal change with changing ideas concerning the aims and purposes of education. Many still believe in long and difficult examinations at periodic intervals. Others contend that tests and examinations interfere with the attainment of the more important aims of education and substitute for one's interest in learning as such, the achievement of marks and rewards extrinsic to true learning.

Within recent years the purposes and functions of tests have become more clearly defined. A trend is apparent at the present time toward the use of a broader term *appraisal* as a substitute for testing and examining children. Appraisal makes use of all usable techniques: observation, interviews, anecdotal records, evaluation of educational products, inventories of personality traits, school habits, and other devices for determining the growth and development of children. The paper-and-pencil test—essay and objective examination, the traditional tool of appraisal—is only one of several tools used in the evaluation of the outcomes of learning; yet so general is the practice of using tests and examinations that it is essential that every teacher understand the nature and purpose of modern tests.

Tests are used for many purposes. Among these are the measurement of intelligence or capacity to learn, the measurement of achievement, and the diagnosis of learning difficulties. Granted that tests are often misused, it is difficult to understand how the efficacy of learning and teaching can be measured with any degree

of accuracy without them. Ordinary observation alone is inadequate. Something more accurate than offhand appraisal of learning is necessary. The objection to tests and examinations is not inherent in the tests themselves, but rather in the use made of them by the teachers. Tests have other worthy functions to perform than that of furnishing data for a record of pupils' progress. It is the purpose of this chapter to make clear how tests may be used in teaching.

A Description and Classification of Tests. Tests are known under a wide variety of terms, such as quizzes, oral reviews, objective tests, written examinations, etc. They vary according to form, use, and type. For purposes of illustration a tentative and partial classification is indicated below.

1. Form
 - a. Oral examinations
 - b. Written examinations
2. Purpose
 - a. Prognostic
 - b. Diagnostic
 - c. Power
 - d. Speed
 - e. Accuracy
 - f. Quality
 - g. Range
 - h. Survey
3. Organization
 - a. Essay
 - b. Objective
4. Period of time of administering
 - a. Daily
 - b. Weekly
 - c. Monthly
 - d. Term
 - e. Semester
 - f. Year
5. Duration
 - a. Short
 - b. Long
6. Method of scoring and interpreting results
 - a. Nonstandardized
 - b. Standardized
7. Abilities involved
 - a. Speed
 - b. Comprehension
 - c. Organization
 - d. Judgment
 - e. Retention
 - f. Appreciation
 - Etc.
8. Nature of materials included
 - a. Arithmetic
 - b. Language
 - c. Reading
 - d. Spelling
 - e. Writing
 - Etc.
9. Mental functions involved
 - a. Association
 - b. Memory
 - c. Recall
 - d. Recognition
 - e. Problem-solving
10. Type of response involved
 - a. Alternate-response
 - (1) True-false
 - (2) Yes-no
 - (3) Plus-minus
 - b. Multiple-response
 - (1) Best answer
 - (2) Correct answer
 - c. Completion
 - d. Matching
 - e. Identification
 - f. Enumeration
 - g. Essay

Other classifications of tests are possible, but these will suffice to show the extensiveness of tests in schoolwork. A number of these classifications need no further explanation, for their titles suggest clearly enough the nature and the purpose of the tests included, while certain other classifications call for a limited amount of discussion to make clear to the reader the character of the tests included under them.

Further Definition and Description. The *essay test* is the old and familiar written examination. The *objective test* or examination is characterized by the fact that it may be checked and scored reliably by anyone who has the scoring key, i. e., it can be scored by two or more persons independently and each will give the same score or rating. Its items or elements are usually so arranged that each item counts as one point. The *prognostic test* predicts probable success. *Intelligence tests*, individual and group, are examples of prognostic tests. The *diagnostic test* reveals learning difficulties; and the *power test* determines how difficult a task a pupil can do. Its elements range in difficulty from very easy to very difficult exercises. The *speed test* determines the number of correct responses which can be made in a given time out of a total number of approximately the same difficulty; the *quality scale* consists of a series of elements or items which vary from a very low degree to a very high degree of excellence. The steps among the elements are equal or their magnitude is known. The *accuracy test* consists of a series of elements of uniform difficulty designed to indicate the percentage of errors which the pupil makes on it; and the *survey test* aims to measure all these elements in different ways to get a rough estimate of general ability. The *standardized test* is an objective test which has a uniform procedure of administering, scoring and interpreting results. It has norms which permit comparisons of the group tested with other groups. The *nonstandardized test* is also an objective test but without norms.

Some types of informal or nonstandardized objective tests serve certain purposes more advantageously than others. Recall is usually most effectively measured by completion tests; and recognition is most effectively measured by *alternate-response*, *multiple-response*, *matching*, and *identification* tests. Certain phases of organization and comprehension and rate of work are also effectively measured by some objective tests. Ability to reproduce or to compose and write cannot be successfully measured by the objective test. This

ability is best measured by a well-organized essay examination the use of which is now again gaining favor.

All these different kinds of tests should be familiar to teachers. There are a number of recent books and manuals on the newer types of examinations.¹ Teachers should aim to understand their chief characteristics and purposes so as to be better able to employ them in improving classroom instruction.

What Tests Are For. When tests are valid and are properly used they should develop a friendly attitude among pupils toward periodical appraisal of progress and arouse an appreciation of their value in improving learning. Too often, tests are considered evils to be tolerated rather than instruments to be used to improve knowledge and methods of work. The unfavorable attitude which pupils often assume toward tests is primarily due to a carry-over of a great many misconceptions from the days when the older types of examinations were badly conceived and so much misused. Why the old prejudice should persist among pupils is often baffling to educational leaders, since in many modern schools pupils welcome and enjoy tests. The unfriendly attitude of pupils toward tests is doubtless due to the fact that teachers have not given testing the same consideration that they have given to other important activities in teaching and to the fact that tests have been regarded as hurdles to be surmounted or as trials to be undergone. An attempt should be made to overcome the fears and prejudices of children and to make them realize the value of tests of the various types. Responding to a good test is a valuable learning exercise. Pupils can gain a variety of experiences from them, among which are: learning new facts, getting new experiences and viewpoints, estimating progress, discovering weaknesses, and finding new facts to learn. In fact, satisfying experiences with tests will teach children to respect their value and use in the classroom.

A Detailed Analysis. A more detailed analysis of the functions of tests is given below in tabulated form for purposes of study. The reader will find it interesting and profitable to analyze the list in an attempt to discover the various old and new uses of tests in the classroom.

¹ Ross, C. C., *Measurement in Today's Schools*. New York: Prentice-Hall, Inc., 1941.

Remmers, H. H., and Gage, N. L., *Educational Measurement and Evaluation*. New York: Harper & Bros., 1943.

A LIST OF FUNCTIONS OF TESTS

- | | |
|--|--|
| 1. To check on extensiveness of reading | 18. To classify pupils |
| 2. To develop a mental set | 19. To check on efficiency of instruction |
| 3. To review materials | 20. To check on loafers |
| 4. To increase comprehension | 21. To get a general idea of a unit of work |
| 5. To focalize attention | 22. To hold pupils to their tasks |
| 6. To find weaknesses in language usage | 23. To collect records |
| 7. To get new viewpoints | 24. To predict success or failure |
| 8. To reveal difficulties in comprehension | 25. To familiarize pupils with tests |
| 9. To develop ability to find one's own errors | 26. To learn new materials |
| 10. To find a starting point in learning | 27. To find out how difficult a task can be done |
| 11. To motivate activities | 28. To reveal the quality of work a pupil can do |
| 12. To compare pupil performance | 29. To develop speed of reaction |
| 13. To orient pupils in an activity | 30. To learn to organize materials |
| 14. To learn what is important in materials | 31. To evaluate materials |
| 15. To discipline pupils | 32. To reorganize ideas |
| 16. To learn to follow directions | 33. To express ideas |
| 17. To promote pupils | 34. To solve problems |
| | 35. To improve thinking |

Among the newer values of tests are those which emphasize the opportunities given for logical self-expression, reorganization of ideas, problem-solving, and creative thinking.

The Subject Matter of Tests. The subject matter of tests varies as widely as the curriculum. In standardized form, tests may consist either of a single type of subject matter, as in an arithmetic test, or of a variety of subjects, as in a reading test of the Sangren-Woody type. Standardized tests are available in almost every subject of the elementary and secondary school. Before such a test is selected, the teacher should examine the subject matter to see whether or not it is suitable for the purpose which he has in mind. If he wishes to test power in narrative reading he might choose the Stone Series of Narrative Reading Tests; if, on the other hand, he wishes to get a general sampling of the pupils' abilities in reading, he might choose either the Gates, the Sangren-Woody Test, or the Iowa Elementary Reading Examination.

Subject matter varies from simple drill exercises, as in an arithmetic test, to complex mental processes, as in interpreting the more

difficult paragraphs of the Thorndike-Lorge Reading Scales. It is important that this subject matter be practical, socially valuable, of good quality, and of interest to the pupil. It is conceivable that many pupils make poor scores on subject matter of little interest to them when they might do much better on material inherently interesting. A teacher's effectiveness in lessons of the testing type is measured by the skill he has shown in selecting a test which contains subject matter similar in kind to the material which the children have encountered in their learning activities. Otherwise the test may measure simply the power developed by the children to react to tests of unsuitable subject matter.

Informal teacher-made tests look for their subject matter to the same sources as the formal test. In this case, however, the teacher has a much more precise control over the subject matter of the test than when he uses a standardized test. Tests of skill in reading may utilize material from any subject. Spelling tests of an informal type should make use of a sampling of the words which the child has been attempting to learn. In history, geography, and other subjects, the material of the test is determined by the content in the subject. In addition to the interest in subject matter, other factors such as the significance, challenge to thinking, and insight involved in solving them, should be important considerations in the selection of tests.

The Construction of Informal Objective Tests.² Since most teachers are more familiar with essay than with informal objective tests, for the present we shall deal with the latter. The construction of informal tests is commonly required of the teacher in a modern school. In order to become expert in the making of tests it is necessary that the teacher have a detailed course of instruction in the techniques of test-making. To give such training here is out of the question. The following paragraphs, therefore, will give the reader a simple outline discussion of some of the outstanding problems which are met in the making of an objective informal test. The good teacher will not be satisfied to use anything except a well-constructed and reliable test.

Steps in Test Construction. The first consideration in a good test is the subject matter which it contains. Here the teacher is in control. He knows what subject matter has been taught and is in a

²See *Teachers Can Build a Test* by Wellington G. Fordyce in the Educational Research Bulletin, Vol. 22 (1943), Ohio State University, pp. 62-5.

position to make a test which adequately measures this. To be valid, the subject matter of a test must be of the type and quality which has been learned by the pupils.

Having determined the subject matter to be included in the test, the next problem is to choose the type of test elements which are most appropriate to the material and the purpose which the teacher has in mind. If it is desired to test the power of a pupil to organize his material, sense relationships, and express thought, the essay test may be the test form to use. If the teacher wishes to test the power of a child to comprehend the meanings of connected sentences and paragraphs, a recognition test, or a test in which the material to be read is furnished to the student for analysis and reflection, may be chosen; if, on the other hand, it is desired to test retention of facts and ideas, a recall test, or a test in which the student is required to remember data without having the original before him, may be chosen. The test type must be appropriate to the purpose which leads to the test. The same test material may be thrown into different forms, depending upon the purpose which the teacher has in mind.

The next consideration is the development and organization of the test elements in terms of their validity, reliability, and ease of scoring and interpretation. This requires a thoroughgoing familiarity with the various types of tests available to teachers. It is necessary, for example, in making an alternate-response test to know how statements or questions should be worded; what particular words in the statements give different shades of meaning, as "always," "frequently," "occasionally," etc.; how many different statements or elements should be included; where answers are to be indicated, i.e., before or after statements; and how answers are to be indicated, as "yes-no," "true-false," or "plus-zero." In making a multiple-response test, it is necessary to know how questions or statements should be worded; how many responses are to be suggested; which one is to be marked by the pupil; how it is to be marked; where the answer is to be indicated; whether it is to be the best or the correct response that is to be marked; and how many questions are to be included in the test. Likewise in making identification, matching, and completion tests, it is necessary to understand the most important factors included in the technique of making them.

The next step in the making of informal objective tests is to

analyze the subject matter to determine whether it contains elements which can be readily adapted to any one of the various types of objective tests. This requires ability to see subject matter in different forms of organization; that is, in parallelisms, cause and effect relationships, contrasting features, tabular arrangement, or other forms. This ability to adapt materials to new forms of organization is acquired through practice in attempting to make tests. A few examples will illustrate how this is accomplished.

The Multiple-choice Test. This type of test is now regarded as a highly useful and reliable test. A sample follows:³

The choker on an automobile regulates the amount of air which enters the carburetor. On a cold day the choker is adjusted so that it diminishes the amount of air used. This makes the mixture richer in gasoline so that it will ignite more easily. As the engine warms up, the position of the choker is gradually changed so that more air may enter to secure the best mixture and to conserve the gasoline.

1. The chief reason why the choker on an automobile is adjusted on a cold day is: (1) more air enters the carburetor; (2) the mixture is richer in gasoline; (3) the automobile runs more smoothly; (4) less air gets through the windshield on a cold day.

This question illustrates the correct-answer type of multiple-response test. It could be made into a best-answer type by shading the meaning slightly for each response. But this kind of question is about as difficult to make as it is to answer by children. It is more desirable to use the correct-answer type with children of the lower grades. In making out multiple-response questions the practice of inserting one incorrect response among three or four correct ones and having pupils find and mark the incorrect one is generally followed.

Alternate-Response and Completion Combined. The paragraph used in Example 1 also lends itself readily to the alternate-response and completion types of statements, as the illustration below shows, but it is not easily adapted to the matching or the identification types. Observe the samples.

Directions. Mark the TRUE statements plus (+); and the FALSE ones zero (0), at the right.

- | | |
|--|-------------|
| 1. The choker on an automobile should always be set so that a rich mixture of gasoline and air will be furnished. | 1. <u>0</u> |
| 2. The choker on an automobile should sometimes be set so that a rich mixture of gasoline and air will be furnished. | 2. <u>+</u> |

³ Adapted from Pieper, C. J., and Beauchamp, W. L., *Everyday Problems in Science*. Chicago: Scott, Foresman & Co., 1927. Teacher's Manual, p. 229.

Directions. In the blank space after the number at the right, write the word which corresponds to the same number in the blank space in the sentence.

1. The (1) regulates the (2) of air which enters the (3).
1. choker
2. amount
3. carburetor

The first alternate-response statement above is false, so it is marked with a zero. The one word which makes it false is "always." The second alternate-response statement is true, so it is marked with a plus symbol. The one word which makes it true is "sometimes." These words are commonly referred to as determinants; that is, they determine whether the statement is true or false as written.

A great deal of care must be exercised, too, in making completion tests. Certain important words should be omitted, but sufficient key words must be retained to enable the pupil to establish the proper associations in the sentence. Auxiliary verbs, adjectives, adverbs, and conjunctions should never be omitted. The technique illustrated in the completion question above is quite involved, but it is very convenient for scoring purposes.

The Matching Test and Test Construction. The following example of a matching test illustrates certain principles involved in test construction: ⁴

Long before the struggle for independence, there was much dissatisfaction in the colonies. Many of the governors whom England sent over were cruel and dishonest. The Americans did not like the transportation of criminals, nor the action of the British government in disobeying the laws made to keep out slaves. They were also much annoyed by the manufacturing acts, which prevented them from sending away woolen goods, hats, and other articles of their own make, from one colony to another. Most of all, they disliked the navigation laws, the object of which was to compel them to do most of their trading with England. The enforcement of these laws was in the hands of custom-house officers who, in 1761, asked the courts for permission to search any house, at any time, for the purpose of finding smuggled goods. This produced a great deal of excitement among the colonists, and further strengthened the cause for a separation of the colonists from their mother country. In 1765 the English Parliament passed another Act which greatly annoyed the colonists. This law, called the Stamp Act, required that all

⁴The material used in this paragraph is adapted from Eggleston's *History of the United States*, New York, by permission of the publishers, D. Appleton Co. (1914).

bills, notes, leases, and other such documents used in the colonies should be written on stamped paper and sold by officers at such prices as should bring revenue to the English Government.

Directions. Match the items in the left-hand column with those in the right by placing the number of the item at the left in the blank space following the item at the right as in the following:

ACTS OR LAWS	IMMEDIATE RESULTS
1. Manufacturing	Searching homes..... 1. <u>3</u>
2. Navigation	Taxing notes, leases, etc..... 2. <u>4</u>
3. Smuggling	Prohibiting inter-colonial trade..... 3. <u>1</u>
4. Stamp	Requiring colonists to trade with England..... 4. <u>2</u>

Directions. Identify and correctly write words which are defined by the following sentences, in the blanks at the right.

- (1) act required bills, notes, and leases to be stamped 1. stamp
- (2) acts prohibited colonists from sending articles of their own make from one colony to another. 2. manufacturing
- (3) acts permitted custom-house officers to search
- (4) acts required colonists to trade with England. 4. navigation
homes 3. navigation

Directions. Place the number of the best response in the blank space at the right.

- The navigation acts were not primarily concerned about:
(1) stamped documents; (2) slavery in the colonies; (3) trading with England; (4) trading with Holland..... 1. 2

In making out tests, such as the type examples above illustrate, a sample should always be given to supplement the directions, and therefore to aid in making the required performance clear and comprehensible to the pupil.

The Identification Test. The paragraph quoted is full of possibilities of making objective tests. It is adaptable to almost any kind of objective test. But not all paragraphs are as readily made into objective tests as this one. There will be much material that can be made into alternate-response and completion tests, but there will be comparatively little that can be adapted to matching and identification tests.

Necessity of Knowing Various Test Forms. These few examples illustrate the importance of familiarity with the use of different forms

in which to organize the best elements in informal tests. The difficulty that is often experienced in making informal objective tests is the lack of knowledge of the possible forms of organization to which subject matter can be adapted. Without this knowledge, the test maker may analyze materials but not know what forms of organization can be most advantageously adapted to these materials. The following suggestions will be found helpful to the teacher in making informal objective tests.

1. Study and become familiar with several new-type tests.
2. Learn the various forms of organization into which subject matter is commonly adapted for testing purposes.
3. Analyze the subject matter with step (2) in mind, and get some experience with reorganizing subject matter into different forms.
4. Continue experimenting with subject matter and new forms of test organization until skill is attained in making a new-type test.

Making the Test Reliable. When the ability to see subject matter in relation to the different forms of test organization has been gained, and when some skill has been attained in devising test questions from subject matter, the test-maker should consider the value of finding sufficient items or questions to make up a satisfactory test. A short test—one composed of ten or fifteen items—is not extensive enough to give a reliable measure of pupil-performance. An informal objective test should contain at least forty or fifty items. Many more would be preferable and desirable, for the more items a test contains, the greater will be the opportunity to get a wide distribution of each pupil's performance. Short tests usually fail to give a wide enough distribution of performance to enable the teacher to check with any degree of accuracy on achievement. In case it is found advantageous to make tests containing a limited number of items, it would be well to let the scores accumulate as tests are administered until a sufficiently large score for each student is obtained. In this way, a distribution may be obtained in which a fairly wide scatter of performance will be shown. The value of short tests of factual knowledge or of skill in performance lies in their flexibility and in the opportunity they give for frequent recall of important data.

How to Make Testing Interesting to Children. The interest taken by children in a testing lesson depends upon several factors: their experience with the subject, their experience with tests and exami-

nations, the ease or difficulty of the test, and the kinds of tests used. Perhaps because they are new, objective tests have struck the fancy of both teachers and pupils so that there has seemed to be little need for motivating the test lesson. Obviously it is motivated to a degree by marks, report cards, and other extrinsic measures. However, the best motivation for test exercises is that intrinsic to the activity itself. If tests are objective, if they are fair, if the results are clearly shown to the pupils, little need for any other attempt to create interest in them will be felt. The prejudice and fear that formerly characterized pupils' attitudes toward tests were due to the misuse of tests by teachers. It is also true, of course, that the objective test is often easier than the old-type essay examination because it makes fewer demands upon the pupil's ability to recall, to think, to organize, and to express his thoughts.

Tests are more interesting when they are given at short intervals, when the pupil helps to correct them, and when he thoroughly understands them. If they enable him to measure his progress and test his skill they are inherently interesting unless the subject they cover is so far from his interests as to be objectionable. Knowledge of the results of tests stimulates pupils to higher levels of achievement than ignorance of either success or failure. Self-checking or self-marking tests, in the use of which pupils do their own scoring, give an added stimulus to an interest in tests.

Tests largely motivate themselves when they are fair and cover interesting subject matter.

Getting Pupils Ready for a Test. Any test always directs as well as stimulates learning. It is rather unusual, although perfectly logical, to make an assignment for a test just as carefully as for any other exercise. Such assignments should make clear to the pupils just what the test is to cover and how to prepare for it. This does not imply that pupils are to be coached for tests, but rather that when tests are to be given they will know the field to be covered and will be familiar with the type of prospective test. The practice of giving tests without warning and with no specific assignment for review and preparation tends sooner or later to develop a dislike for tests among pupils, for without preparation they do not have a fair chance. The general principle of studying for a specific purpose is also applicable to preparing for tests and examinations. Most pupils make a different kind of preparation for the objective test than for the essay examination. They give more attention to

details when preparing for an objective test than when preparing for the essay type.⁵

Preparation for tests should include a systematic review of the materials to be tested. This review should be carefully directed. The teacher may suggest methods of work, relative emphasis on different items, and types of response to be required. Pupils may then prepare themselves adequately, and success, in a large measure, is insured. The test thus has its value in motivating and directing learning. Adequate assignment in preparation for the test lesson is a characteristic of good teaching.

Administering Tests and Examinations. The class activities of a testing or examination period may be enumerated as announcing the test, preparing the pupils to take it successfully, controlling the time, distributing the tests, supervising the taking of the tests, correcting the papers, and arranging and interpreting the results of the test. All or part of these activities may occur in any given testing or examination period.

The announcement of the test ordinarily should occur at a previous period, and children should be enabled to prepare for it. At times, the test may be unannounced and given without previous preparation. The latter type of test is frequently used as a means of keeping pupils keyed up to their best efforts and is a legitimate use of testing if not overdone. It is also frequently used as a means of finding out what children know or do not know about the subject in advance and as a preliminary to diagnostic and remedial instruction.

Preparing the pupils to take the test includes the reading or giving of directions, the administration of the fore-exercise, if any, and the answering of any questions that may arise in the minds of the pupils with respect to the mechanics of the test. Enough time should be taken to make the test mechanics clear so that no child may fail because he does not understand the directions.

The conditions essential to the actual taking of tests should be described in detail before they are administered. These conditions involve, in part, stating the nature of the exercises, the number of items or elements in the test, how they are to be checked or marked

⁵ Class, E. C., "The Effect of the Kind of Test Announcement on Students' Preparation," *Journal of Educational Research*, Vol. 28 (1935), pp. 358-61.

Terry, Paul, "How Students Review for Objective and Essay Tests," *Elementary School Journal*, Vol. 33 (1933), pp. 592-603.

by the pupils, the time allowed, the method of proceeding without unnecessary delay, and whether guessing is or is not permitted. It is usually advisable to work out a sample exercise with pupils before urging them to launch into the test proper. This practice orients them correctly from the start and oftentimes prevents them from making unnecessary mistakes. At the very beginning, the teacher should emphasize the importance of the test so that pupils will not take it too lightly and as a consequence fail to make a good showing. The way in which the examination is conducted will largely determine the nature of the attitude which pupils will eventually take toward testing as an activity. In case the test is in a standardized form, written directions must be strictly adhered to. When the teacher-made objective test is used it will be found necessary and advisable to supplement the printed directions by oral explanations, unless an unusual amount of care has been taken in preparing them. Even then some oral instructions may be necessary to make clear the nature of the performance required.

Distributing the tests is sometimes an important matter and requires that precautions be taken so that pupils who are too eager will not read the material or mentally or otherwise perform some of the exercises before the teacher is ready to call time. Sometimes this requires careful arrangement of the tests in packages that will facilitate their distribution, and care in training monitors to aid with the distribution of the material face down on the desk.

Controlling the time of the test is a very important matter in the use of standardized tests where a time limit is imposed. The teacher must have exact knowledge of the directions of the test and have either a watch with a second hand or a stop watch to use in controlling time. Scrupulous care must be used in starting and stopping on time and seeing that no pupils exceed the time allowed.

While the pupils are taking the test, the teacher must supervise the work to prevent waste of time, dishonesty, etc. Probably there is no teacher clever enough to prevent dishonesty entirely, but every teacher should try to make cheating and distractions rare. Control of heating, lighting, and ventilation during long testing periods is important. The teacher should try in every way so to conduct the test period that all pupils work steadily and without interruption.

The problem of what to do after time has been called and the tests are ready to be corrected and interpreted is so important as

to merit special attention. It is now common to engage the pupils in this activity and train them to do the necessary detailed work. The teacher must have a certain amount of technical information and skill in order to do this successfully. Enough of this information will be given here to enable the student to understand a class exercise in which teacher and pupils are studying the results of tests.

The practice of using the recitation for scoring tests is sometimes advisable, and it often aids in the development of a more friendly attitude among pupils toward them. This can be done by supplying pupils with an answer key and having them score their own tests or one another's; or the teacher may dictate the correct answers and have pupils mark their own tests. If the latter practice is engaged in, the teacher should recheck all tests marked by pupils in this manner.

Studying the Results of Tests. The results of any test depend upon its validity, reliability, and ease of scoring. The validity of a test depends upon whether or not it measures what it purports to measure. In a democratic program of education many important outcomes are not measured by objective tests. If a teacher wishes to measure broad comprehension, understanding, creative expression, organization of ideas, and ability to think, he will of necessity have to use the essay examination for this purpose as well as careful observation of the behavior of children under different conditions. In any case, the reliability of a test depends upon whether it measures consistently what it is meant to measure. The latter function depends upon the number of items in the test and the number of times it has been given. In interpreting a test, therefore, if it is a test which the teacher has not made himself, he needs first to ask:

1. Is this a real test of the facts, understandings, abilities, or skills to be measured?
2. Is the test long enough to be reliable?

Validity. Does the test measure those items which are important in the subject? If not, it is not a good test, and the results may be dispensed with as insignificant. Some objective tests have a discussion of their validity in the test manual. Other tests are highly recommended by experts. The teacher's informal test may be submitted to other teachers and its validity judged by them. Pupils may be asked to pass on the validity of the test.

Reliability. In order to be reliable, a test should contain a suffi-

cient number of items to give a stable result; i.e., it should measure consistently what it measures. Ordinarily it should contain enough items to permit a reliable measure of the function or functions involved. That will mean the items should be carefully selected and free from ambiguities. Since part of the unreliability of a test is due to the failure of the pupils to understand or to follow directions and so to give their best effort, the teacher should exercise considerable care in administering it. The pupils should be encouraged to do their best, regardless of the nature of their previous preparation for it.

Furthermore, the test should contain enough easy items to measure the ability of the poorest pupils in the class and enough reasonably difficult items to measure the ability of the best pupils. The items may be distributed from the easiest to the most difficult ones, although it is not necessary that they be arranged in that order to insure reliability.

Finally, certain extraneous factors should be controlled. The same instructions should be used each time the test is given and the same procedure should be employed in scoring the items and in interpreting the results. All distractions should be removed, and abnormal conditions, such as fatigue and emotional tension, should be eliminated. It is a known fact that the results of an examination are occasionally made unreliable because of illness and emotional tensions of the pupils.

Scoring the Tests. When tests have been administered, the duty of arranging them and scoring them faces the teacher. When administering objective tests, he should make use of the pupils for this purpose. Scoring the tests furnishes an interesting and profitable class exercise for children. The teacher may read from the answer key and pupils may correct one another's papers; or, if preferred, each pupil, using a scoring key, may correct his own test. The latter method is a good one to use as a means of training pupils to understand the real purpose of tests and to become interested in correcting their own errors rather than merely looking for a mark.

Determining Point Scores. For ordinary school purposes, the plan of evaluating scores on teacher-made objective tests or on standardized tests need not be involved. It is sufficient to count each correct response, best response, correct association, or correct identification made by pupils as one point; and in case of alternate-response and multiple-response exercises, one point may be assigned to each

wrong response or error. To penalize for guessing, the number of wrong responses may then be subtracted from the number of right ones. This practice is a variable one among teachers. Some teachers prefer to use one of the following formulas: $(R - W)$, $(R - W/2)$, $(R - W/3)$, or $(R - W/4)$, depending on whether the test is composed of questions or statements requiring one correct response, or one best or correct response out of two, three, or four possible responses. But many teachers are not interested or concerned about guessing unless the test is to be employed for diagnostic purposes. In most instances, teachers are interested in learning how much actual progress pupils are making, as indicated by the number of questions or statements which they get correct on a given test. The matter of penalizing for guessing on tests is an optional one. It need not be strictly adhered to. Many standardized tests do not have this requirement for scoring. Nor do questions need to be weighted for ordinary purposes. This practice is involved and is unnecessary.

Making the Answer Key. The answer key may be made from a copy of the test. This is done by taking one of the test papers and filling in the correct symbols (zeros, pluses, minuses, arabic numbers, etc.) in the right margin of the page. Then any excess blank margin at the extreme right may be trimmed and the key folded the long way to make it convenient to handle in scoring. Samples of two answer keys are given here for study.

AN AWKWARD KEY		A CONVENIENT KEY	
$\frac{+}{0}$	1. Ridicule and an	al maladjustment.....	1. $\frac{0}{0}$
$\frac{0}{0}$	2. The problem of	a simple one.....	2. $\frac{0}{0}$
$\frac{0}{0}$	3. The use of prais	creases the rate of	
	learning from	3. $\frac{+}{+}$
$\frac{+}{0}$	4. Best growth come	erials is of such a	
	nature that all	e every problem.....	4. $\frac{+}{+}$
$\frac{0}{0}$	5. The investigatio	ence is more funda-	
	mental than that	on the I. Q.....	5. $\frac{+}{+}$

A Convenient Way of Scoring. It is important that teachers understand a practical and convenient plan of scoring tests. There are several ways by which test-scoring may be simplified. Some teachers prefer to construct their tests or have them made so that the answers to the questions will be indicated by the pupil in the left-hand margin of the page. Then the answer key can be made from

a copy of the test by indicating the correct answer or response in a manner identical with that indicated by the pupil on the test. The key may then be folded or cut so that it may be conveniently placed over the test with the answers on the key corresponding to the answers made by the pupil on the test. The correct or incorrect answers are readily marked by a pencil—preferably a colored one—and the points totaled in a brief time. However, this method of scoring is awkward for right-handed people. A more convenient way to facilitate scoring tests is to construct them, or have them constructed, so that all answers will be indicated by the pupil in the right hand margin of the test page. Then the answer key may be made from a copy of the test as indicated above and manipulated so that the answers of the scoring key will correspond to those indicated by the pupil when it is placed over the test. This method of scoring tests is convenient for right-handed people and is more practical than the other method mentioned above.

Interpreting the Test Scores. The interpretation of the test scores is probably one of the most difficult problems which confronts the teacher who uses objective tests of an informal nature. Ordinarily a person who uses informal objective tests should be familiar with certain statistical concepts, as the median, mean, quartile, and standard deviations. Unfortunately many teachers either do not have the time to make distributions of their test scores and to apply the proper statistical techniques or they are indifferent about the matter. It is admitted that the calculation of the quartile and standard deviations or the percentile ranks of a distribution of scores is quite involved, but it has to be done if an accurate interpretation of the scores is desired. However, there are other methods of handling test scores which teachers may employ within certain limitations. One of these methods consists of adopting the technique of the normal distribution curve as a general guide. Samples of standard distributions, which show the percentage of raw scores included within the different sections of the curve, are given here for study.

A NORMAL DISTRIBUTION

MARK	PER CENT		
A	10	7	3
B	20	24	17
C	40	38	60
D	20	24	17
F	10	7	3

These distributions are all symmetrical, and if they are used in determining letter grades for students, will prevent unwarranted variation in marking standards. Their chief weakness is that more often than not the test scores for any given class do not conform to the normal distribution curve. This technique for giving marks applies best to large groups of unselected pupils, as might be found in a required subject in a freshman class, less well to small groups, and still less well to highly selected groups in a senior class. But it is to be disregarded when there is good reason for doing so. When a class is either definitely superior or inferior, skewed distribution curves should be employed, such as the following illustrate:

A SKEWED DISTRIBUTION

MARK	PER CENT	
A	15	10
B	25	10
C	45	50
D	10	20
F	5	10

It may not be the policy of the school system to employ these set formulas for giving marks to students. If it is not, then a modified form of these methods may be used. The scores on the test papers may be arranged in order of size from the highest to the lowest or vice versa. Or the test papers themselves may be stacked in order of the size of the scores on them from the highest to the lowest. Then, beginning with the paper containing the lowest score, count to the test paper which "marks off" one-fourth of the cases. Record the score of this test paper, and then count to the test paper which "marks off" one-half of the cases. Record this score also, and continue counting until you have reached the test paper which "marks off" three-fourths of the cases. Record this score as before. Now you have established the first quartile point (Q_1), the second quartile point (Q_2), and the third quartile point (Q_3). Since the second quartile point, which is the median, does not always correspond to the mean, you may obtain the latter in the usual way.

Next subtract the score on the test paper at Q_1 from the score on the test paper at Q_3 and divide by 2. This gives the quartile deviation. The formula is:

$$\text{Quartile deviation} = \frac{Q_3 - Q_1}{2}$$

For all practical purposes, the quartile deviation may be used to develop your scale for transmuting the test scores into letter grades. The discussion of the illustration which follows will show how all of the necessary calculations are made.

Make the frequency distribution of the scores of the test. This is done by marking off equal segments on a horizontal line to correspond to the class intervals in the total range of scores of the test. Then indicate the number of cases at each point on the horizontal line. Study the data of Figure 3.

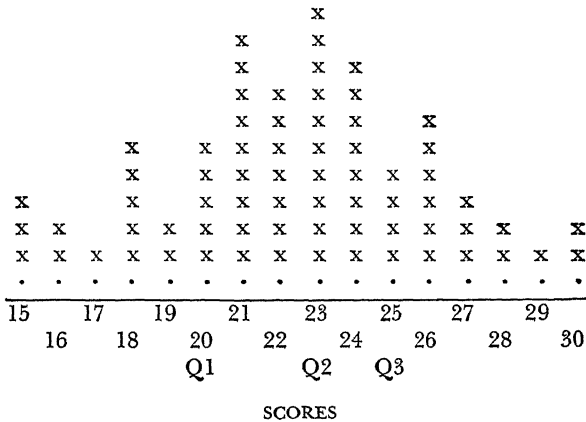


Figure 3. Distribution of scores made on an informal objective test.

The size of the class interval of this distribution is one. The range of scores extends from 15, which is the lowest score made on the test, to 30, which is the highest score. The number of cases is 70, which is the number of pupils who took the test. The distribution is fairly uniform and free from "gaps" between points on the base line. The technique should not, therefore, be applied too rigidly at the dividing points on the scale.

In order to find Q_1 you take $\frac{1}{4}$ of 70, which is 17.5 in this instance, and count the number of pupils who made score 15, 16, and so on, to a point which includes the 17.5 cases. In the illustration, that point is 20. This is Q_1 . You find Q_2 by taking $\frac{1}{2}$ of 70, which is 35, and counting to a point which includes 35 cases. That point is 23. In a similar manner, you can find Q_3 , which is located at point 25.

Now using the formula for finding the quartile deviation and

substituting the number 25 for Q_3 and the number 20 for Q_1 and dividing by 2, you obtain Q , which is 2.5. Observe the formula:

$$Q = \frac{25 - 20}{2} \text{ or } 2.5$$

It is now possible to find the boundary points for C grades on the base line of the distribution curve by measuring $\frac{3}{4}Q$ below and above the median, and the division points between D and F and B and A by measuring $1\frac{1}{4}Q$'s further in each direction, or by measuring $2\frac{1}{4}Q$'s in each direction from the median.

The next step consists in locating the division points for the letter grades on a scale as follows:

$$\begin{array}{ccccccc} & \cdot & & \cdot & \times & \cdot & \cdot \\ -2\frac{1}{4}Q & & -\frac{3}{4}Q & \text{Median} & \frac{3}{4}Q & & 2\frac{1}{4}Q \end{array}$$

Beginning with the mid-point on the scale, which is 23, and counting to the right, you add $\frac{3}{4}$ of 2.5 to the 23 in order to obtain the point $\frac{3}{4}Q$ on the scale. This point is 24.87. You obtain $2\frac{1}{4}Q$ on the scale by adding $1\frac{1}{2}Q$'s more or by adding $2\frac{1}{4}Q$'s to 23. This point is 28.62 on the scale. It is not necessary to locate points beyond $2\frac{1}{4}Q$'s above and below the median, because all of the scores which fall above $+2\frac{1}{4}Q$ will be given A and all scores that fall below $-2\frac{1}{4}Q$ will be given F.

Since it is not necessary to calculate the points on the scale in terms of fractions of points, you may omit any decimal below .5 and add it to the adjacent whole number if it is .5 or larger. The scale now is as follows:

$$\begin{array}{ccccccc} -2\frac{1}{4}Q & & -\frac{3}{4}Q & & \times & & +\frac{3}{4}Q & & +2\frac{1}{4}Q \\ \cdot & & \cdot & & & & \cdot & & \cdot \\ \hline 17 & & 21 & & & & 25 & & 29 \\ & & & & 23 & & & & \end{array}$$

After the several points have been established on the scale, you may then refer to the frequency distribution and count the number of cases below 17. It is 5 in the illustration. There will, therefore, be 5 students in the lowest section, the F-section of the scale. Then count the number of cases between 17 and 21 exclusive. It is 13 in the illustration. There will, therefore, be 13 students in the next lowest section, the D-section of the scale. In a similar manner, you continue counting until you have all of the cases of the distribution accounted for. Study the illustration.

5 F's	13 D's	34 C's	15 B's	3 A's
.	.	x	.	.
17	21	23	25	29

There will be 5 F's, 13 D's, 34 C's, 15 B's, and 3 A's in this distribution of scores. There is a precaution which the teacher should observe in transmuting numerical scores into letter grades, and it is that of looking for "gaps" between scores which may occur in the neighborhood of the dividing points in a distribution. That is to say there should be some flexibility in applying the technique, for there is nothing sacred about using exactly one quartile deviation instead of .8 Q or 1.1 Q in fixing the width of the section of the scale.

If it is desired to use the mean instead of the median in making the scale, you may do so. As has been said you can obtain the mean by finding the sum of all the scores and dividing by the number of cases. If you find the mean, then you should find the standard deviation (S.D.) by the following formula and mark off points on the scale similar to the method used in the preceding example:

$$S.D. = \sqrt{\frac{\text{Sum of squares of scores}}{\text{Number}} - \text{sq. of mean}}$$

In using this formula, you square all the scores, add the products, divide by the number of cases, subtract the square of the mean from the sum, and extract the square root of the remainder. The technique gives practically the same results as the one described in the example. It is not difficult to handle if you have a manual of tables available for squaring numbers.⁶

Using the Results of Informal Tests. When the data indicated in the previous discussion have been worked out, the teacher is in a position to discuss the meaning of results with children. The marks can be explained on the basis of the distribution of scores. Each test item may further be studied in terms of the number of errors made on it, and diagnostic work may be followed by remedial teaching. Often an entire recitation may profitably be devoted to a study of the results of either a standardized or an informal ob-

⁶ This method of obtaining the standard deviation may be found in such books as: H. E. Garrett's *Statistics in Psychology and Education*, new second edition, Longmans, Green & Co., New York, 1937; and E. F. Lindquist's *A First Course in Statistics*, Houghton Mifflin Co., Boston, 1938.

jective test. This procedure will make pupils aware of their weaknesses and improve their efforts. The progress of the class may also be revealed from time to time by showing the gain made from one test to another. Tests may also be used to acquaint the pupils with the minimum essentials of the subject. It is only when follow-up demonstrations of this character are used that tests and examinations justify the time and effort spent in making and giving them.

Other Methods of Appraisal. Recent methods of appraising the results of learning go beyond the mere measurement of the subject matter which the pupil has acquired and remembered. While modern methods of appraisal are cognizant of what he does, they are primarily concerned with his habits of work and his behavior in general. In the progressive school there are many improved opportunities for teachers to observe the pupil's interests, attitudes, ability to cooperate, habits of work, methods of attack, and his work-study skills. The pupil's behavior thus revealed gives a more complete picture of his attainment than his performance on formal examinations. To evaluate learning while it takes place requires the use of many different kinds of techniques.⁷ Scales are needed to evaluate pupils' attitudes, questionnaires to discover their interests, inventories to check their emotional stability, anecdotal records and case studies are needed to obtain evidence of their social, physical, emotional and mental development. The primary purpose of these techniques is to obtain systematic records of pupils' behavior while they are engaging in learning activities.

The essay examination is still the best means of evaluating ability to organize and write ideas in coherent discourse. The newer view of the essay examination is that it includes writing reports, short articles about useful things, preparing notebooks, writing letters, etc. In writing about such activities pupils learn how to organize and express their ideas as well as how to apply their knowledge in practical situations. As for the reliability of the essay examination, teachers need not worry over the matter. They are just as reliable as the teachers who use them. Several studies⁸ reveal that essay tests can be scored reliably by trained people.

⁷ Olson, W. C., *The Behavior-Journal Manual of Directions and Forms*, University Elementary School. University of Michigan, 1935.

Randall, John A., "The Anecdotal Behavior Journal," *Progressive Education*, Vol. 13 (1936), pp. 21-26.

⁸ Traxler, A. E., and Anderson, H. A., "The Reliability of an Essay Test in English," *School Review*, Vol. 43 (1935), p. 538.

Stalnaker and Stalnaker⁹ report that essay tests of all kinds can be read with reliabilities of 80 and over.

The Outcomes of Tests. The outcomes of any practice naturally reflect the functions of that practice. This is as true for one form of activity as for another. The reader can obtain, in a sense, a preview of the results of the use of tests by turning back to the discussion of the purpose of testing. Moreover, there are always additional and concomitant learnings which result from a well-planned and organized procedure of doing things. These will be listed with other outcomes of tests here:

1. Friendly attitudes among pupils toward tests
2. Satisfaction from using tests to improve learning conditions
3. Enthusiasm for tests aroused through motivating activities included in a testing program
4. Interest in other activities resulting from taking tests
5. Improvement of language usage
6. Pride in accuracy and neatness
7. Skill in answering questions and statements
8. Satisfaction resulting from developing abilities to spell correctly, to write legibly, to pronounce and enunciate distinctly in dictation exercises
9. Satisfaction resulting from improved behavior in activities

STUDY QUESTIONS

1. What phases of tests and examinations were emphasized in this chapter?
2. What are examples of tests as to purpose? Organization? Mental functions involved? Abilities included?
3. What purposes of tests mentioned in the chapter are primarily concerned with improving learning conditions in the classroom?
4. What purposes are largely teacher purposes? Which ones are pupil purposes?
5. Why is it important that the teacher construct informal objective tests?
6. How may one determine what test will be best adapted to a given unit of material?
7. What is an example of a unit of material to which the following types of objective tests may be readily adapted: matching tests, identification tests?
8. What can be done about testing in order to arouse interest among pupils for the practice?
9. What is the significance, if any, of employing the same general procedure of testing as of teaching?

⁹ Stalnaker, J. M., and Stalnaker, Ruth O., "Reliable Reading of Essay Tests," *School Review*, Vol. 42 (1934), p. 599.

10. What are the conditions in testing that usually lead to cramming?
11. Why might it be an advantage to teachers to learn to use tests before learning to construct them?
12. What are several conditions which should be carefully adhered to in conducting a testing program for improving instruction?
13. Why should children be given a great deal of opportunity to take tests and to become familiar with their usefulness?
14. What statistical devices are essential to the interpretation of the results of tests?
15. What is the chief value of a quartile deviation scale in interpreting scores?
16. Why should the teacher learn to employ statistical techniques in determining letter grades from numerical values?

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Chapter XXI PROMOTING PUPILS AND REPORTING THEIR PROGRESS

The school has the important responsibility of interpreting to parents the policy employed for promoting pupils and reporting their progress. Obviously it is also the school's duty to make an adequate interpretation of these practices to the pupils themselves. Parents and pupils alike measure success by the absence of failure and by achievement of regular promotion from grade to grade. They are conditioned to a certain amount of failure and to a type of quantitative marking system by long-established practice. Since they are likely to accept past practices as valid, whatever improvement in marking systems and promotions may take place is largely in the hands of administrators and teachers. It is therefore essential that teachers become familiar with the newer developments in the promotion of pupils and the reporting of their progress.

PROMOTION

Parents have the right to assume that their children have practically a 100 per cent chance of promotion. This is a matter that the school has not regarded very seriously, and as a consequence, when children fail to keep pace with the program of curricular activities, their parents sometimes challenge those in authority as to the cause. Certainly they have the right to know why their children fail. The excuse generally given is that the child has failed to "apply himself," or that for some reason the work of the grade

was "too hard" for him. Seldom does the school take the real responsibility for preventing failure or for adjusting the work of the child so that he will not fail. In recent years some schools have adopted the policy of passing all children continuously through all grades and of adjusting instruction in each grade to their abilities. This policy will be discussed later. Now we shall turn to the causes for failure which are due to certain beliefs and practices with respect to promotion and success or failure in the classroom.

Causes of School Failure. Usually teachers and parents alike believe that it is disastrous not to begin formal education when children reach the age of six years. They believe also that reading must be taught to all first-grade children regardless of their readiness to begin the subject. Tradition causes them to cherish such a belief. They do not understand that some children are too immature to profit from being introduced to reading at this stage. Nevertheless, modern research supports the contention that children should not be introduced formally to reading before they have reached the mental age of six and one-half years. It is now known that about 25 per cent of first-grade children are not mentally mature enough to begin reading. Since this is so, it is not surprising that the greatest percentage of failure is found in the first grade. In fact, almost 20 per cent of the children of the first grade fail to gain promotion and approximately 99 per cent of the failures of the first grade are due to reading difficulties.¹

While the failure of children in the more advanced grades is not as common as in the first grade, the problem of nonpromotion is almost as serious. The inflexibility of the curriculum, which is not adapted to the needs of the pupils in these grades, is the fundamental cause of the difficulty. Since many children, on account of their limited ability, can not do the work of a school grade in one year, they are often required to repeat the work, although the results do not show that such a practice is successful in causing the children to "master" the school subjects. This practice has done much to create the condition shown in Table 6.

The fundamental cause of nonpromotion and failure lies, then, in the practice of setting up an inflexible graded curriculum and failing to take into account individual differences in rate of learning, growth, and development. As long as school administrators

¹ Pugsley, C. A., "Reducing and Handling School Failures," *American School Board Journal*, Vol. 86 (March, 1933), p. 18.

think of the school as an institution which is to eliminate the unfit, this practice will go on. But modern theory is beginning to revolt against it. Democracy in education requires that the school treat the dull and average as well as the bright in such manner that the total welfare of the less able children is achieved.

TABLE 6. Enrollment by Grades in the Elementary Schools of the United States for 1943-1944 ²

GRADES	NUMBER OF PUPILS
Kindergarten	697,468
First	2,878,843
Second	2,220,739
Third	2,162,878
Fourth	2,079,788
Fifth	2,016,635
Sixth	1,997,806
Seventh	1,964,997
Eighth	1,693,942
Total	17,713,096

It is obvious from Table 6 that there is a larger number of pupils from grades 1 through 3 than from grades 4 through 6. Why are there 2,878,843 children in grade 1 and only 1,693,942 in grade 8? The main reason is a retardation of children in the lower grades due to the promotional practices of the schools.

How can the schools justify the large percentage of failure and elimination? It is only on the ground that every child should achieve a certain standard of performance each year or else fail of promotion and repeat the work a second or even a third year. This practice is now being challenged widely, and modern opinion favors passing all children, who are working up to their capacities, within their social age groups and adjusting instruction to their needs by individualizing progress in achieving skills and essential information. The fear that such a practice lowers standards is not warranted. It actually improves the achievement of the slow learners.³

Plans for Reducing Nonpromotion. The excessive retardation in, and the elimination of children from, the upper grades, as revealed in Table 6, may be remedied by a flexible program of schoolwork

² Biennial Survey of Education in the United States, 1946, Federal Security Agency, U. S. Office of Education, Washington, D. C.

³ *Seventeenth Yearbook, Schools in Small Communities*. Washington, D. C. American Association of School Administrators, 1939. P. 64.

and promotion. Some school administrators recommended the semi-annual promotion plan. A few recommend the 100 per cent promotion plan. Others recommend either the enrichment plan or the extrapromotion plan. All of these plans may be satisfactorily employed if teachers and school administrators wholeheartedly attempt to make the necessary adaptations. They all have their weaknesses and advantages.

The Semiannual Promotion Plan. There are reports to the effect that this plan operates much better in the larger school systems than in the smaller ones. In some school systems where the semiannual plan has been used, it is claimed that failures are increased instead of alleviated. Feingold⁴ reports that 23 per cent more pupils fail under this plan than under the annual promotion plan. Furthermore, it is stated that the pupil-teacher adjustment incident to the reorganization of the school at midyear resulted in a 30 per cent drop in scholastic achievement. Some even criticize it on the basis of a loss of several weeks of instructional time. But this can hardly be significant, in as much as it is most difficult to evaluate such loss. The plan can not be strongly recommended for the small school systems, however, because of the small size of groups which accompany the use of the plan.

The Continuous-Promotion Plan. This may also be called the democratic plan for the reason that it discourages failure and accepts the responsibility for the continuous growth of the individual child. Every child passes his grade on the basis that he has made progress in growth and development commensurate with his capacity. It is the plan of the activity schools. While it is not without its objectionable features, the trend in American education is toward the adoption of some such plan.

Evidence⁵ of an objective nature reveals, among other things, that failing children who are promoted to the next grade achieve more than other children of approximately comparable ability and who are required to repeat the same grade. More recent evidence⁶ reveals that when a grade is repeated, only 35 per cent of the children did better than they had originally done, 53 per cent made

⁴ Feingold, G. A., "Promotional Plan and School Efficiency," *Educational Administration and Supervision*, Vol. 25 (Mar., 1939), pp. 182-90.

⁵ Brueckner, L. J., "The Cumulative Effects of the Policy of Non-Failing," *Journal of Educational Research*, Vol. 28 (Dec., 1934), p. 289.

⁶ Samson, W. H., and Bertsche, F. T., "Failures Cut to One Per Cent," *Journal of Education*, Vol. 124 (Oct., 1941), pp. 238-39.

no improvement, and 12 per cent did poorer school work. This is further proof of the advantage of promoting every pupil who has revealed some improvement during the school year and of adjusting the work for the following year at the level where the child left off the preceding year.

Many administrators and teachers who feel duty-bound to abide by uniform and traditional standards of attainment of subject matter will have nothing to do with the 100 per cent promotion plan. They contend that there are certain elements of subject matter which every child must learn. This must be done, they believe, before promotion can be justified.

That such practice disregards the fact that children grow and learn at different rates and have definite limitations as to ultimate achievement is at once apparent. It can hardly be accepted in view of the fact that growth is highly variable and mental power an inherited trait. Disregard of variations in inherent capacity to learn is one of the chief weaknesses of the traditional practice of promotion.

Unfortunately some administrators and teachers maintain that nonpromotion is an unavoidable evil for which no substitute can be found. It can be said that these educators need not look very long to discover quite adequate substitutes for nonpromotion. The great trouble with many school people is that they are disturbed when asked to launch out upon some new enterprising technique or procedure. Finally, some teachers are still teaching textbooks rather than children and are more interested in academic achievement than in the all-round development of children.

Schools which are still engaged in large-scale nonpromotion practice are doing very little, if anything, to further the growth and development of children's personalities. Progressive thinkers believe that nonpromotion can not be justified except in a few instances when children's social and physical immaturity makes success in the next grade practically impossible. At least, this view is being rapidly accepted by many school people today.

A Practical Solution. A practical solution of the problem of promotion can not be suggested for teachers in any given school district because of the varying standards in schools. If the policy of a school favors a rigid promotion plan, the individual teacher will have to follow that plan until a better one is developed in his community. In the meantime, however, the teacher can favor a

more liberal plan of promoting children and work for its adoption. American school administrators ⁷ look with favor on such changes in policies of promotion as the following:

1. Social group promotion with group and individual help to enable children to work up to their achievement levels.
2. Social group promotion unless the teacher can prove the need or benefit of retardation.
3. Prevention of failure by social diagnosis and the use of effective remedies.
4. No fixed grading or promotion in one-room schools.
5. Promotion by subject where that is possible.
6. Adaptation of subject matter and method to the pupils' abilities, even in secondary schools.

In summary, it may be said that promotion plans and promotion policies are looking toward flexibility and the welfare of the individual pupil.

REPORTING CHILDREN'S PROGRESS

Recently there has been much controversy over the matter of reporting children's progress to their parents. Many school administrators still employ the conventional card system, which over-emphasizes subject-matter ratings and gives the parents little information about the character development of their children. Others employ a wide variety of means of informing parents of their children's progress. These include letters in which a diagnosis of the child's development is made, descriptive reports elaborating on the nature of the child's progress, home visits, rating sheets, and representative samples of children's work. Some of these devices, especially letters and specimens of children's schoolwork, usually accompany one of the more formal methods of reporting children's status in school.

Report Cards. The conventional report card is still the popular way of reporting children's progress to their parents in spite of its many weaknesses. However, many modified forms of the traditional report card are now in use as a result of recent research in better ways of reporting children's school status.

The conventional report card has a number of points in its favor. It is brief and convenient to handle as well as easy to interpret. But it has also certain weaknesses among which is the lack

⁷ American Association of School Administrators, *Seventeenth Yearbook*, p. 64.

ROCK VALLEY ELEMENTARY SCHOOL Rock Valley, Iowa				
Report of.....				
For Semester beginning.....Ending.....				
Grade.....Class.....				
PERIOD	1st	2nd	3rd	Final
Days Absent.....				
Times Tardy.....				
Days not Enrolled.....				
Spelling.....				
Writing.....				
Arithmetic.....				
Language or Grammar.....				
History.....				
Hygiene—Health—.....				
Physical Training.....				
Drawing.....				
Manual Training.....				
Home Economics.....				
Phonics.....				
Geography.....				
Music.....				
Civics or Citizenship.....				
Department.....				
.....				
.....				
(See the other side)				

Figure 4. The main features of a conventional report card (front side).

of detailed explanations of the causes of failure or lack of satisfactory progress. Another quite common fault of the conventional report card is the emphasis given to the achievement of the school subjects and the lack of proper consideration of other equally important functions of the children's personalities.

Some of the weaknesses of conventional report cards have been corrected in the improved forms which are now gaining popularity among progressive teachers. Such items as making the records ob-

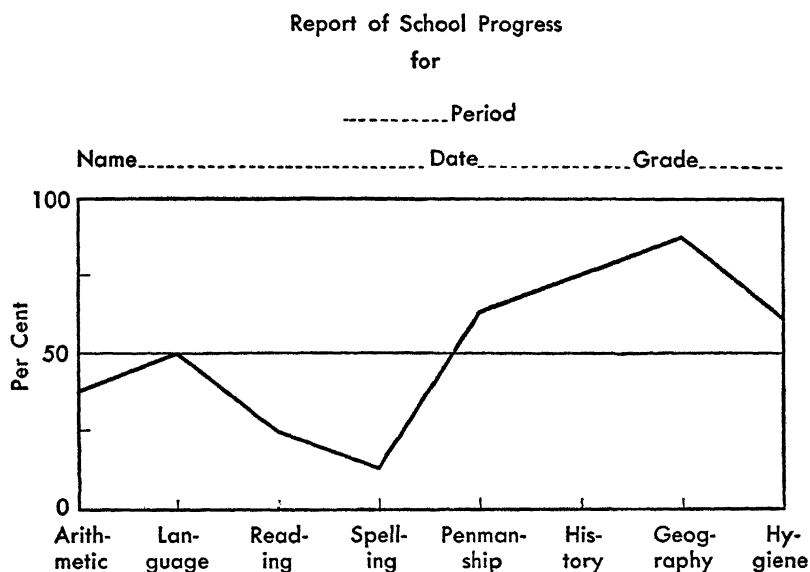


Figure 5. The main features of a graphical report card (front).

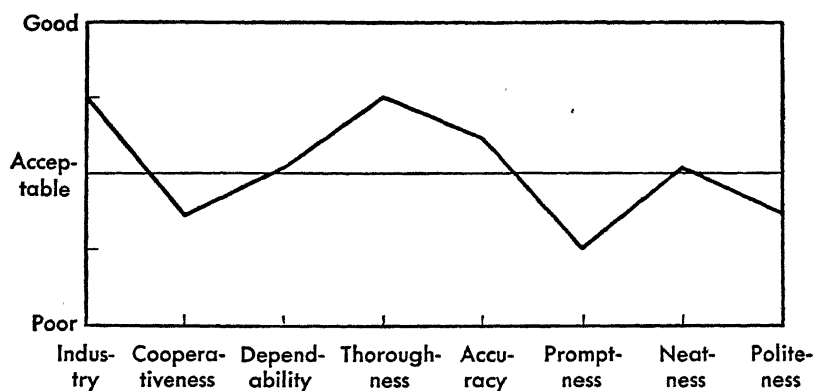


Figure 6. The main features of a graphical report card (reverse side).

jective and representing each individual's progress graphically in relation to that of his age or grade, are typical improvements of the conventional type report cards. The samples above illustrate the conventional and newer type of report cards.

Descriptive letters. This is not a new method of reporting children's progress to their parents. Indeed, it is quite old, having been used for years to supplement the data of the conventional report cards. In a sense it is quite modern in that its content has been greatly simplified through the use of terminology derived from the objective-test movement of the past quarter century. Instead of being devoted to generalities about children's progress, the new type of descriptive letter to parents describes their progress in relation to that of the average for the particular age group or grade. Parents are informed whether their children are in the upper quarter, middle half, or lower quarter of the group, and are encouraged to keep them aware of the importance of being in the middle half or upper quarter of their class if their native capacities indicate it possible for them to do so. Obviously, descriptive letters can inform parents much more in detail about their children's progress than report cards. That is the chief reason for their popularity with progressive school people.

Descriptive letters need not be too elaborate. If they convey to the parent or guardian just that information which will be most helpful in obtaining the fullest cooperation, they will have served a useful purpose. The sample illustrates how a descriptive letter may be written.

Dear _____

Harry is doing quite well in most of his school subjects. He rates above the average of his class in history, geography, hygiene, and civics, and about average in arithmetic. But he is below the average of his class in spelling and in oral and written expression. His penmanship is not satisfactory.

A glance at Harry's previous school record shows that he is capable of doing better work in his language subjects. We believe he is going to do better work, but he will need all of the encouragement that you can give him at home.

Harry could be a little more industrious and dependable than he is. Perhaps he may be encouraged to take a more active part in certain family chores or other activities of home life than he now does. Anything that requires a certain amount of personal responsibility on his part will be useful in improving his schoolwork.

Above all, encourage Harry to keep his schoolwork at least average or better.

Sincerely,

Signed _____

Home Visits. This method of reporting children's progress to their parents is not widely employed for the obvious reason that teachers are not generally able to discuss intelligently with parents the various circumstances contributing to failure or lack of proper adjustment. Among other things, visiting teachers need special training to carry on their work successfully. Many persons are inclined to believe that considerable emphasis must be given to the social aspect of preparing teachers to make home visits as well as to make adequate reports of their calls. It is apparent that the success of this method is greatly dependent upon the teacher's being a social worker and a competent diplomat. When bad news is to be reported to parents, there are many possibilities of their misunderstanding the actual facts involved. This makes it absolutely necessary to have the problem clearly in mind and all of its details at hand before visitation. Success in using this method develops with experience. It may be made a most valuable supplement of the card system.

A SAMPLE FROM A RATING SHEET ⁸

Is the pupil slovenly or neat in personal appearance?

x	x	x	x	x
Unkempt	Rather Negligent	(Average) Incon- spicuous	Concerned about dress	Very tidy

Does the pupil accept authority?

x	x	x	x	x
Defiant	Critical of authority	(Average) Ordinarily obedient	Respectful	Accepts all authority

Rating Sheets. These may be organized in the form of inventories or information blanks, containing numerous items to guide teachers in evaluating children's personalities. Their comprehensiveness makes them superior devices for presenting a picture of children's school performance to their parents.

Rating sheets have the advantage over other printed devices in that the children's success or failure may be presented graphically

⁸ Adapted from page 64, *Problem Tendencies in Children*, by W. C. Olson, University of Minnesota Press, Minneapolis, Minn., 1930.

as well as in tabular form. In this respect the rating sheet combines the desirable features of the report card and the inventory. The arrangement of the data on the sheet makes it possible for parents to see at a glance whether their children are above or below the average performance of the group of which they are members.

A Practical Solution. In the primary grades, the report may consist of a written statement explaining the extent to which the children are making satisfactory adjustment at school. This statement may be made three or four times a year or oftener and contain such items as children's attitudes, their interests and habits, their chief improvement or lack of improvement, etc. A statement such as the following may be sent home.

Noel is studious and shows considerable interest in most of his school work. However, he has difficulty in expressing himself in what is generally regarded as acceptable English. This is not because Noel doesn't know his grammar, but because he is shy and doesn't take part in social activities. You may feel certain that we are doing what we can to improve his social habits.

If it is desired to make a more formal report than a written statement, the teacher or other school official may design some sort of tabular report card and employ symbols to represent certain descriptive terms, such as "satisfactory," "unsatisfactory," "improvement," etc. The category of factors to be rated may include "social habits," "work habits," "growth," and the like.

The traditional report card used the percentage plan of marks in which 60 to 70 per cent was regarded as a passing mark and 100 per cent as perfection. Under the attack of the scientific method, the percentage system has given way to the letter system based upon statistical distributions and the normal curve. The latter type of marking system seems to be yielding in turn to a plan of rating pupils either as satisfactory or unsatisfactory. In this case, "satisfactory" means working up to capacity; "unsatisfactory" means, of course, the opposite. Sometimes a mark of "A" is given for superior work. The trend is toward the use of a modified marking system in which less emphasis is placed upon detailed and highly differentiated marks. The reason for this development is the emphasis now being placed on the general all-round development of the children rather than upon scholarship alone. In general, if a modified system of marks is used, the fewer the distinctions made the better.

Some school officials and employees believe it is a waste of time to report children's achievement more than three times a year. They doubt whether parents need to be informed formally every four or six weeks of their children's school status. They argue that parents may judge about how well their children are doing on the basis of their school work of the previous year, and if, for some reason, their work takes an unfavorable turn, the teacher can send home a report to this effect. Thus the matter may be handled co-operatively.

Others believe that the purpose of the report to parents is to stimulate children to greater growth and development. It is not merely to report achievement or to assign school "marks." The report is an essential educational procedure which helps the school discharge its duty to parents. Considered in this light, the report to parents may become an invaluable means of guidance to both children and parents when the newer types of reporting are adopted by the schools.

In any case, the teacher will have to use whatever form of report card the school administration favors. He may do much, however, to inform the parents of the child's general development through home visits and informal notes when occasion permits, especially if he observes the following principles.

SOME GUIDING PRINCIPLES IN MAKING REPORTS

1. Report children's growth and development in simple English.
2. Report only such information as will aid in obtaining the cooperation of the parents.
3. Make the report brief but clear. Use no expressions which the parents may not clearly understand.
4. Report items to parents when they will have the greatest influence in producing changes in the children.
5. Make the reports as informal as possible.
6. Make a duplicate copy of every report.
7. Anticipate the nature of the responses which are likely to result from the report and be prepared to meet criticism that may be raised.

STUDY QUESTIONS

1. Why should parents be informed as to the cause or causes of their child's failure to gain promotion?
2. What are some causes of school failure?
3. What percentage of children of the first grade fail to gain promotion?
4. What are the failures of the first grade mainly due to?

5. What are some probable causes of pupils dropping out of grade school?
6. What is the relation of immaturity of children to retardation?
7. What are some plans for reducing nonpromotion?
8. What are objections to semiannual promotion plan?
9. Why may the continuous promotion plan prove satisfactory in the grade school?
10. What are the chief weaknesses of the conventional report card?
11. What are several desirable ways of reporting pupils' progress to parents?
12. Which one of the modern methods of reporting pupil progress might possibly obtain the best results?
13. What are several guiding principles of reporting the progress of children to their parents?

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15. SMITH, E. R. "Work of the Committee on Records and Reports," *Progressive Education*, Vol. 27 (January, 1936), pp. 441-45.

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That individual differences exist has long been recognized, but little or nothing was done about it until objective testing revealed the extent and nature of the problem in teaching. Now every book on principles and methods of teaching emphasizes the need for adapting instruction to the needs of individual pupils. It is necessary, therefore, that the teacher be reasonably familiar with the nature and range of individual differences and be prepared to employ remedial measures which are now regarded as useful in adjusting the school program to the pupils' rate of learning.

THE RANGE OF INDIVIDUAL DIFFERENCES

The range of individual differences is emphasized by surveys of intelligence, interests, capacities, and achievement. Scientific measurement reveals that differences in ability to learn vary considerably among large numbers of unselected children in a given grade of the school. The data presented in Figure 7 shows the wide variability in mental ages of an ordinary group of girls. The distribution curves are for the same children at three different ages.

It is plain that these children differ greatly in mental age at each chronological age level. The overlapping of the curves reveals that some of the 12-year-old children are as bright as some of the 16-year-olds, while others are no brighter than 8-year-olds. Thus it may be presumed that there are many 12-year-old children who are two or more years below the average in mental age, and also many who are two or more years above the average in ability to learn. The difference in mental age among ordinary groups of children is

great enough to warrant careful consideration of the matter by both teachers and school administrators. Methods of teaching, the preparation of materials, and the standards to be maintained should be in accord with the facts as shown by educational research. The spread of differences in ability to learn is entirely too great to justify the teaching of all children as if they were alike.

Wide Range in Readiness for Instruction. First-grade children not only differ greatly in their capacity to learn but also in their read-

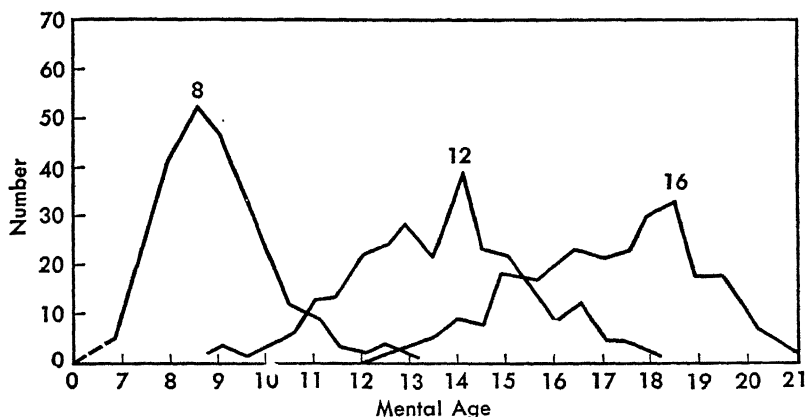


Figure 7. Distribution curves of mental ages of 167 girls of ages 8, 12, and 16. (After Dearborn, W. F., and Rothney, J. W., *Predicting the Child's Development*, p. 325. By permission of the Sci-Art Publishers, Cambridge, Mass.)

iness to learn from the start. This fact is well demonstrated in the distribution shown in Figure 8. The record is for 152 first-grade children on the Metropolitan Readiness Tests.

It is apparent that the children measured by this test vary greatly in the extent to which they have profited by their experiences. Some are ready for the first grade, according to the test standards, but some are far from ready to benefit from formal instruction in reading, language, figures, and handwriting. That fact is apparent from a glance at the distribution of scores in Figure 8. The highest scores mean that a few children have a superior vocabulary, a high perceptual maturity, and a good command of information and number work. The low scores reveal that some children have a very limited command of these functions. They are likely

to be too immature to learn with the same degree of efficiency as the other children. Many of these children will doubtless fail to learn by the usual methods of instruction if they enter the first grade without some preparatory training.

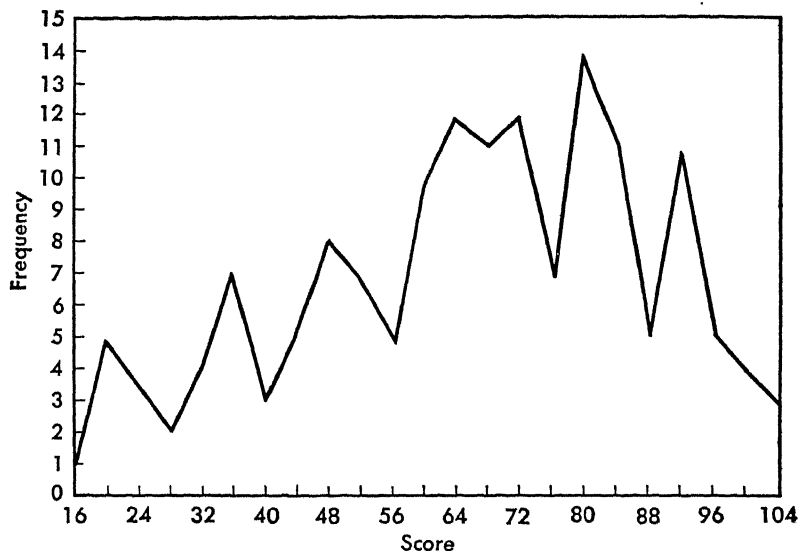


Figure 8. Distribution of reading readiness scores for 152 first grade children. (By permission of Hildreth, Gertrude, *Learning the Three R's*. Educational Publishers, Minneapolis, Minn., 1936, p. 348.)

Wide Differences in Word Knowledge. Children differ considerably in their knowledge of word meanings. This is shown in Figure 9.

The range of word knowledge among these ninth-grade pupils is fairly typical of the great difference in achievement among school children. In this particular word test which was organized into a crossword puzzle, a few ninth-grade pupils are not much beyond the intermediate-grade level, whereas a few are well above their present grade level in word knowledge. As the distribution reveals, a few pupils could comprehend the meanings of but seven or eight words in fifteen minutes, while a few could grasp the meanings of more than fifty words in the same period.

These illustrations show that great differences exist among pupils in learning. Additional information could be cited if necessary, but it would point to the same conclusion. In consideration of

these facts, the question that naturally arises is, What is the most efficient method to organize children in order that they may make the most of their possibilities? In most instances, the usual plan of group organization of pupils for instruction is likely to be mechanical and inflexible. All children are likely to be taught in the same classes with the same materials and by the same methods.

The data cited emphasize the importance of using the results of objective tests and techniques, such as observation, cumulative records, and the like for exploratory purpose in order to determine the readiness and capacity of children to learn. Although some educators object to using tests for classification purposes and for providing for individual rates of learning, the opposite in practice is blindly to treat all children as if they were alike. The increasing

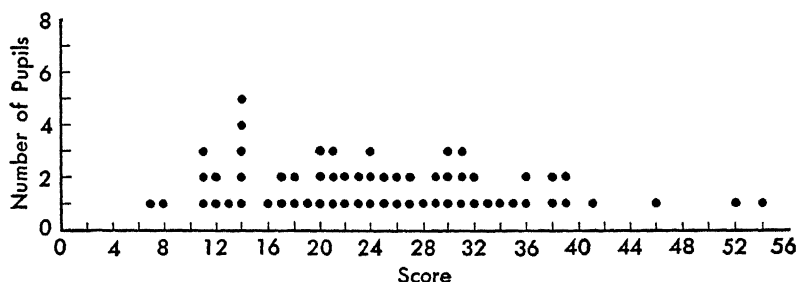


Figure 9. Distribution of word knowledge of 62 ninth-grade pupils. The mean score is 25.08.

tendency to use tests, observation, questionnaires, cumulative records, case studies, diagnostic inventories, and appraisals of the pupil's performance in creative and constructive work as a basis for pupil classification indicates progress.¹

The problem of adjusting the school and the classroom methods to these differences among children is momentous. Its solution has been attempted again and again in many different ways, chief among which are individual instruction, homogeneous grouping, unit plans, extra promotions and the various methods of adapting materials, techniques, and procedures. The importance of these measures in preventing failure and consequently nonpromotion of those children who fail to meet subject-matter standards, is our greatest concern to date. But before we consider various plans,

¹ Gates and others, *Educational Psychology*. New York: Macmillan Co., 1942. Pp. 601-22.

methods, and techniques, it may be of some value to teachers to refresh their memories concerning the probable causes of these great differences among children.

CAUSES OF INDIVIDUAL DIFFERENCES

Since the causes of individual differences are usually discussed in books on educational psychology, this discussion will be limited, for the greater part, to those causes the investigation of which will be most helpful to teachers in adapting their instructional techniques to the children's problems of learning.

Certain causes of differences among children are much more apparent than others. Differences in the physical characteristics of sex and race are more obvious to the casual observer than the differences due to maturation, family, or environment. Anyone can distinguish a boy from a girl or a colored child from a white, but it is not so easy to recognize the differences in mental characteristics among sex and race; nor is it easy to recognize the rate of growth of children and the influence of near ancestry and the environment on their mental and physical functions. These are factors which become apparent only after careful study of the data revealed by research during recent years.

Sex as a Cause of Differences. Aside from the obvious fact that boys are physically stronger than girls and that convention requires boys to do certain things that it does not exact of girls, there are no essential differences in the two sexes. There are no unique mental qualities which the one sex possesses that the other does not also possess. If there are differences, these are of a quantitative character rather than qualitative.

Research of the past fifteen or twenty years reveals interesting quantitative differences in certain mental functions among boys and girls. Some of the data of certain studies² support the inference that 60 per cent of the boys in a given school reach or exceed the median of the girls in arithmetical reasoning. In the memory of words, 40 per cent of the boys reach or exceed the median of the girls. In certain high school subjects, studies show a slight quan-

² Book, W. F., and Meadows, J. L., "Sex Differences in 5,925 High School Seniors in Ten Psychological Tests," *Journal of Applied Psychology*, Vol. 12 (1928), pp. 56-81.

See also Heilman, J. D., "Sex Differences in Intellectual Abilities," *Journal of Educational Psychology*, Vol. 24 (1933), pp. 47-62.

titative difference between the sexes. In English, for example, 34 per cent of the boys reach or exceed the median of the girls; in French, 32 per cent of the boys reach or exceed the median of the girls; and in Latin, 40 per cent of the boys reach or exceed the median of the girls. These are approximate figures and reveal a trend in the differences existing when the research was conducted.

In intelligence, boys and girls are quite similar, in spite of the fact that some early students of psychological testing thought that they had discovered a wider range of mental ability among boys and men than among girls and women. If there is a difference in intelligence between boys and girls, it is so slight that teachers may well disregard it.

There are important social differences between the sexes—many more boys are delinquent and criminal than girls. Girls and women are arrested for breaking the law about one-twentieth as often as boys and men. This may be due, in part, to the fact that female offenders are not convicted and sent to prison in the same proportion as the male offenders. Nevertheless, reports³ indicate that girls are delinquent about one-tenth as often as boys.

Race as a Cause of Differences. It is not easy to determine the influence of race on the differences of individuals, for the obvious reason that scientists are not able to discover "pure stocks." Furthermore, they cannot always distinguish between inherited and acquired characteristics of individuals; yet some evidence is available on this subject. In fact, there are enough research data to warrant a few inferences. Approximately 25 per cent of the Negroes reach or exceed the median of the whites in intelligence in the same community. In terms of the I.Q., Negroes rate on the average about 83 on tests involving verbal abstractions. A comparison of data⁴ obtained in different sections of the country reveals that the southern Negroes rate below the northern and western Negroes in I.Q. points.⁵

The American Indian with an average I.Q. rating of approx-

³ Shalloo, J. P., "Youth and Crime," *Annals of the American Academy of Political and Social Science*, Vol. 194 (1937), pp. 79-86.

⁴ Klineberg, O., "Racial Differences in Speed and Accuracy," *Journal of Abnormal and Social Psychology*, Vol. 22 (1927), pp. 273-77.

See also Jordan, A. M., *Educational Psychology*, revised. New York: Henry Holt & Co., 1942. Pp. 309-50.

⁵ The I.Q. is a device to measure the rate of growth of intelligence and is determined by dividing the mental age by the chronological age.

imately 78 is slightly less alert than the American Negro. Research reveals that when either of these two races is mixed with the white race, there is an increase in mental alertness of their offspring. While some of these facts will have little significance to the average teacher, they are more difficult to find and much less reliable than those previously referred to. For further information on the subject the interested student may wish to consult books on educational psychology.

Maturation as a Cause of Differences. Maturation is a term which includes both growth and development. Growth refers to the quantitative changes within the human organism, whereas development refers to the qualitative changes. Both types of changes occur as the result of stimulation of the mental and physical functions. The stimulation may come from within the organism itself or it may come from sources outside. In either case, growth and development are dependent upon stimulation. It is common observation that children grow in height and weight, but it is not so apparent that they grow at different rates and reach maturity at different age levels.

The importance of understanding something of the nature of growth and development is at once apparent when it is recognized that some children have much difficulty in adjusting to the requirements of formal education. Experimental evidence indicates that they are frequently too immature to do successfully many of the tasks assigned them when they enter school. Some children at six years of age find it almost impossible to perform certain school activities, such as reading and handwriting, but given another year in which to grow and develop, they will be able to perform these same activities with ease. As children mature they find previous tasks much easier to do, and what is more important, they do them with less worry and anxiety.

More than most teachers realize, maturation enters into the problem of teaching beginners to read. Usually, if children cannot learn to read at the age of six, they can read at the age of seven or eight, unless, of course, their mental growth has been retarded. Generally speaking, most school systems permit children to enter the first grade at the age of six regardless of their mental maturity. Some educators recognize that chronological age and mental age do not necessarily parallel each other in growth, and advocate that children be permitted to enter the primary school if they have a

mental age of six years. This fact⁶ is in accordance with the findings of research. It is fast being realized by teachers that children should have attained at least the mental age of six years and six months before they are permitted to begin reading under a rigid and inflexible program. They appreciate the futility of attempting to teach children reading when they lack the necessary maturity to profit from the experience, unless special provisions are made for teaching immature learners such as characterize the readiness programs of progressive schools.

It is possible to go on relating the results of experiments to show that much time is wasted in our schools by teaching subject matter that is too difficult for children to understand at any given age level, but that will not be any more convincing than the citation of an almost classical experiment dealing with the subject of maturation of infants—the Gesell and Thompson study of the importance of maturation in child development.⁷ These investigators selected a pair of infant twins whose characteristics were sufficiently alike to permit using the term “identical” to describe them. They were identical twins. When the twins reached the age of forty-six weeks, twin E was given six weeks’ practice climbing three or four steps which led to the edge of a crib. Twin C was not given practice until she had reached the age of fifty-three weeks, which was a week later than the time when twin E ceased practice. After six weeks of practice twin E successfully climbed the steps in twenty-five seconds. Then at the age of fifty-three weeks, twin C began the practice of climbing the steps. On the very first trial, twin C climbed the steps in forty-five seconds. This performance was better than that of twin E on the first trial, but it was not as good as twin E’s record at the end of the six weeks’ practice period. After twin C practiced climbing the steps for two weeks, it was discovered that she had attained the ability to climb them in ten seconds. This performance was superior to that attained by twin E at the end of the six weeks’ period. It is thus apparent that the increased maturation of twin C plus the two weeks’ practice, made her performance more proficient than the six weeks’ practice at an earlier period by her twin sister. Similarly, there is reason to believe

⁶ Morphett, Mabel, and Washburne, C., “When Should Children Begin to Read?” *Elementary School Journal*, Vol. 21 (1931), pp. 496-503.

⁷ Gesell, A., and Thompson, H., *Learning and Growth in Identical Infant Twins*. Worcester, Mass: Genetic Psychology Monographs, Vol. 6 Clark University, (1929).

that as striking results as these hold true for intellectual maturity and learning.

Family as a Cause of Differences.⁸ The influence of the family or near ancestry in causing differences in individuals has been investigated by psychologists to a point where considerable data are available. These data relate to the characteristics of twins, siblings, and cousins. Although it is impossible to exclude the influence of the environment upon differences due to inheritance among children, for purposes of this discussion it may be said that the environment is reduced considerably as an influencing factor in causing differences when children of the same parents are the subjects of investigations.

Siblings, i.e., brothers and sisters, differ from twins in that they are less alike in their inheritance, yet are like twins in that they have the same or nearly the same environment because they live under similar cultural and socioeconomic conditions. Obviously no two children, even those born of the same parents, have exactly the same environment. However, if we may say that they have practically the same environment, then it is possible to measure the traits of a pair of twins and a pair of siblings, and by the simple process of arithmetic find the difference which heredity contributes.

Table 7 shows the increase in similarity of the mental traits of families, the closer the relationship existing between individuals. It is adapted from the results of twelve investigations,⁹ and reveals the family resemblance in mental characteristics.

TABLE 7. The Relationship in Mental Traits of Related Pairs of Persons of Northern European Stock

RELATIONSHIP	CORRELATION COEFFICIENTS
Unrelated children	— .19 to .09
Cousins	.27
Parents	.46 to .49
Parent-child	.45 to .55
Siblings (same home)	.45 to .55
Nonidentical twins	.55 to .70
Identical twins	.88 to .97

⁸ The classical studies of the illustrious families and the notorious feeble-minded families are omitted in the discussion for the reason that other information is more essential for the teacher to know.

⁹ Based on data by Green, E. B., *Measurements of Human Behavior*. New York: Odyssey Press, 1941. P. 176.

These correlations show that the increase in blood resemblance is accompanied by a corresponding increase in the resemblance of mental traits. As may be seen from these data, twins who develop from the same fertilized ovum are more alike than twins who are born at the same time but develop from two different ova. Likewise, nonidentical twins are more alike than siblings, and siblings, in turn, are more alike than paternals, etc. It is therefore quite possible that heredity influences the resemblance of traits much more than we are willing to admit.

There has been much argument about the constancy of the I.Q. over the span of life since the first data were collected on the subject. There are marked differences of opinion on the subject, as may be observed from studying the reports in Parts I and II of the *Thirty-ninth Yearbook of the National Society for the Study of Education*. Stoddard¹⁰ and Wellman¹¹ furnish data which tend to question the constancy of the I.Q., but Goodenough¹² and other investigators¹³ doubt the validity of these data.

Several recent investigations, notably Wellman's study, of the intelligence of children reveal that their mental status can be improved when they are removed to a better environment. The improvement is not too impressive, but it is sufficient to be recognized by educators.

Environment as a Cause of Differences. The causes of individual differences are so interrelated that it is most difficult to find any reliable information about the contribution of any single causative factor. The one important fact, however, to be remembered is that the teacher must deal with the differences among children as he recognizes them, regardless of their causes. This is simple advice, but it is good common sense. Another important consideration that should be obvious to the teacher is that he can change the chil-

¹⁰ Stoddard, George D., and Wellman, Beth L., "Environment and the I.Q.," *Thirty-ninth Yearbook* (1940), Part I, National Society for the Study of Education, Public School Publishing Company, Bloomington, Illinois, pp. 405-42.

¹¹ Wellman, Beth, L., "Iowa Studies on the Effects of Schooling," *Thirty-ninth Yearbook* (1940), Part II, National Society for the Study of Education, Public School Publishing Company, Bloomington, Illinois, pp. 377-99.

¹² Goodenough, F. L., "New Evidence on Environmental Influence on Intelligence," *Thirty-ninth Yearbook* (1940), Part I, National Society for the Study of Education, Public School Publishing Company, Bloomington, Illinois, pp. 307-84.

¹³ See other studies in the *Thirty-ninth Yearbook* of the National Society for the Study of Education.

dren's environment but he cannot change their heredity. The latter condition is fixed before birth. Consequently the teacher must look to the environment for changes to be made for the purpose of improving children's opportunities for growth and development.

The numerous studies of foster children constitute the best source of information on the influence of the environment on the differences among children. Some of these studies are quite conservative in their findings. Others seem extravagant. The *Chicago Studies*,¹⁴ as they may be called to distinguish them from others, seem conservative, for they give relatively small gains in I.Q. as shown from the measurement of the intelligence of children reared in good and poor homes. Table 8 contains the results of a typical study¹⁵ dealing with the influence of good and poor homes on children's I.Q.'s.

TABLE 8. The Influence of Good and Poor Homes on the Intelligence Quotients of Foster Children¹⁶

TYPE OF HOME	NUMBER OF CHILDREN	PRETEST I.Q.	RETEST I.Q.	GAIN
Good	33	95.2	100.5	5.3
Poor	41	88.0	88.1	0.1

The data in Table 8 shows that children placed in good homes improve a little in their I.Q. rating, but even so it is considerably more than the improvement of children placed in poor homes. This same study also reveals that younger children benefited more in mental growth than older children, which may indicate that early adoption of children in good homes is preferable to late adoption.

These results appear to be conservative when compared with the findings of the *Iowa Studies*,¹⁷ which reveal marked influence on children's I.Q.'s during the preschool years as the result of en-

¹⁴ Newman, Horatio H.; Freeman, Frank N.; and Holzinger, Karl J., *Twins: A Study of Heredity and Environment*. Chicago: The University of Chicago Press, 1937.

¹⁵ Freeman, F. S., *Individual Differences*. New York: Henry Holt & Co., 1934.

¹⁶ Adapted from Freeman, F. S., op. cit.

¹⁷ Skeels, H. M.; Updegraff, Ruth; Wellman, Beth L.; and Williams, H. M., *A Study of Environmental Stimulation: An Orphanage Pre-school Project*, Iowa City, Iowa: University of Iowa, Studies in Child Welfare, 1938.

Also: Skeels, Harold M. "Some Iowa Studies of the Mental Growth of Children in Relation to Differentials of the Environment," *Thirty-ninth Yearbook*, (1940), Part II, National Society for the Study of Education, Public School Publishing Company, Bloomington, Illinois, pp. 281-308.

vironmental changes. For example, the report based on a study of orphanage children shows that they gained 21 points in I.Q. when placed in a favorable environment for a period of twenty months. What is most unusual is that two preschool children gained 31 points during a similar period of twenty months, while five control subjects who had no nursery-school training lost 15.4 points in I.Q. On the basis of Terman's classification of I.Q.'s, these children could increase or decrease their intelligence in such manner that they would be gifted at one period of life, average at another, and possibly low-grade moron if not feeble-minded at still another. These are unusual findings, to say the least, and are doubtless open to considerable criticism.

These studies further show that children living in institutional environments, such as orphan homes and institutions for the feeble-minded, had their I.Q.'s materially influenced for better or worse, depending upon the essential nature of the environments in which they found themselves. Some of the children who lived in quarters where there were other children whose mental capacities were quite low, lost in I.Q. points, whereas other inferior children who lived with normal children gained in I.Q. points. Thus the children tended to change to the mental status of their associates.

Another of these studies reveals the influence of nursery-school training on later success in college. It seems that good preschool training displays itself quite favorably later in college, for the college students who had good nursery-school training demonstrate even greater mental power than they did as preschool children. This is a bit of evidence that has tremendous possibilities for school officials when they are in the process of organizing programs for the primary school.

These studies are so full of unusual findings that pages could be devoted to their analysis. But it will not be possible to do this. The interested reader will want to consult them for firsthand information.¹⁸

It should be said, however, that the *Iowa Studies* are without corroboration to date. Nevertheless, they are suggestive of the possibilities of improving children's mental status by controlling their environments.

¹⁸ Wellman, Beth L., op. cit.; Stoddard, G. D., op. cit.; Skeels, H. M., op. cit.; Goodenough, Florence L., op. cit.

METHODS OF PROVIDING FOR INDIVIDUAL DIFFERENCES

There are various formal ways of providing for individual differences among children in growth, development, and learning. These usually include changes in the curriculum and in the school organization itself. In the large school systems, other formal methods, such as extra promotions, are used. Practically all of these methods and plans are difficult to employ in the small school systems. For that reason they are not nearly so popular in the latter as the informal methods. One of the most popular of the formal methods of providing for individual differences is homogeneous grouping.

Homogeneous Grouping. This is one of the oldest of the formal methods of providing for differences in learning among children. It is commonly referred to as "ability grouping." The change in name is new, but it is still the old method in principle. There are many schoolmen who strongly believe that ability grouping will solve the problem of differentiating progress in learning in conventional schools. In academic achievement, this may be true, but they overlook certain important considerations, such as the needs and interests of children. It is not a simple matter to group children according to their interests, needs, and abilities. Ordinary observation reveals that some groups of children are fairly homogeneous in one function but heterogeneous in another. It is practically impossible to find children who are homogeneous in all functions and traits. Even twins are not alike in every respect.

The matter of homogeneous grouping becomes somewhat objectionable, therefore, in view of the difficulty of segregating children on the basis of their experiences, interests, attitudes, habits of study, sociability, etc. In fact, when the entire personality of the child is considered, the problem of effecting adequate grouping for instruction is most difficult. The method calls for a subjective analysis of functions or traits. To the objectivist this is dangerous, since the reliability of such analysis is generally questionable. However, it is now believed that the children's personalities should not be disregarded in organizing groups for homogeneous instruction. If the matter were merely one of grouping children according to their academic ability, the objective test would serve that purpose. But the problem is not so simple as this. Ideally, the evaluation of children's attitudes, their social habits, and in fact all of the traits

which constitute their personalities, should be considered before adequate grouping can be accomplished. Some educators believe that children of the same level of physical development should be grouped on the basis of their preferences for playmates and organized games. That is to say that they should be grouped socially for classroom instruction. This may prove to be the best way to organize children in groups, for their likes and dislikes are important not only for certain social functions but also for those who are to participate in these functions.

The objective-minded persons who hesitate to employ evaluating criteria of a subjective nature in grouping children homogeneously, should observe how unpopular their method of grouping children has been in many school systems. It is a known fact that segregating children on the basis of their scholastic standing has not materially increased their achievement in the school subjects. However, it may be pointed out that the failure of homogeneous grouping to bring about general improvement among children may not be due to the method of grouping homogeneously, but rather to the uniform and rigid procedures which are often employed in teaching and in curriculum organization. Unless curricular changes are made and teachers adjust their procedures to the new conditions which occur as the result of ability grouping, there is no strong argument in favor of this practice.

Another circumstance which contributes to the failure of conventional grouping to improve conditions of achievement is the lack of teachers' consideration of the children's physical status and the proper maturation of their mental functions. If children are not sufficiently mature to learn advantageously at a given period in their lives, or if they are not physically fit to put forth their best efforts in study, it probably does not matter much whether they are grouped homogeneously or otherwise, since they will not make much progress under any circumstances. These are considerations which should be evaluated in grouping children for instruction.

It is, however, incorrect to say that some sort of grouping may not be employed to advantage in the conventional school, since it works well in those schools where the children's personalities constitute the most essential criterion for grouping. In any case, the plan of grouping children for instruction should be flexible enough to allow for some shifting of its members from one group to another when necessity demands a change.

The Winnetka Plan. This plan requires a certain amount of reorganization of the school program. It practically does away with the recitation as such, and places the emphasis on the rate of learning. Under this plan, each pupil's work in the skill subjects as well in some of the content subjects is done on the individual basis. The curriculum is organized into definite units of work. Instruction, work sheets, and diagnostic and final tests are organized into unit assignments and given to the pupils, who proceed at their own rate. The order of procedure is about as follows: A pupil begins a series of units in each fundamental subject and continues at his own rate, with only as much assistance from teachers as is needed, until he completes a unit. He then takes a test covering the work, and if he has satisfactorily mastered the unit, he goes on to the next assignment without interruption. In this manner he continues until he has reached a "goal," several of which are to be attained in each school subject. Teachers are kept busy preparing the materials for instruction, counseling, and checking the success with which each individual pupil does his work.

The plan does not neglect the social life of the children. Their schoolwork is so organized that approximately one-half of the school day is devoted to social activities, as plays, games, assemblies, and various kinds of creative work, and one-half to the fundamental subjects. Thus a desirable balance between group and individual instruction is maintained.

The Dalton Laboratory Plan. This plan, which is also referred to as the contract plan, is somewhat more individual in its operation than the Winnetka Plan, primarily because the daily program is so organized that the children devote the greater part of the school day to individual activities. In fact their work is so individualized that they spend much of the school day doing individual assignments at their own rate.

The daily program of work provides fifteen to thirty minutes in the morning for planning the children's assignments for the rest of the day. Then it provides two to three hours for the children to work in subject-matter laboratories; and in the afternoon, it makes provision for individual and group work in creative and athletic activities.

Under the Dalton Plan, there are laboratories which are equipped with the necessary materials, charts and books to further the work of a particular school subject under consideration at any

given time. Each assignment covers the amount of work to be accomplished in one school month. The monthly allotment is regarded as a "job." There are eight to ten "jobs" to be done in a school year. Each unit of work has a carefully planned procedure for the children to follow. It includes work sheets, practice material, and check tests. When the pupil has completed a given unit, he takes a mastery test. If his performance on it is satisfactory, he continues with the next assignment. In this manner, he does all of his assignments for the school year. He is not permitted, however, to do assignments at an advanced level after he has completed the equivalent of a year's work in any given subject. Instead, he is encouraged to complete all of the assignments for each school subject at his grade level. The teacher's work under this plan is to prepare the contracts and see to it that the subject-matter laboratories are adequately equipped for carrying on the pupil activities as well as to check the mastery of each individual contract. The teacher is also responsible for directing the pupils in their laboratory work or study.

This plan requires all children to have command of the skill subjects before they are permitted to work under the contract plan. It can not, therefore, be employed in the primary school or below the fourth-grade level.

Other Formal Methods and Procedures. These include special and double promotions as well as changes in grade organization. Hence they are not easily adapted to the smaller school systems. In fact, school systems which have small enrollments and limited finances will find it quite impracticable to make changes in their grade organizations or to adopt extra promotions as means of providing for individual differences among children. It is much easier and far more practical to adopt informal procedures for this purpose than to disrupt the school organization by attempting to employ measures which operate successfully only in the larger school systems.

As a matter of fact many larger systems after having tried the formal types, are now going back to the self-contained classroom type of organization as more satisfactory.

SYSTEMATIC METHODS OF PROVIDING FOR INDIVIDUAL DIFFERENCES

Less formal methods of providing for individual differences place the emphasis upon changes in teaching and learning proce-

dures. They are popular in small school systems for the obvious reason that they require no essential reorganization of the school. Typical of these methods is the differentiated assignment. Others are subject-matter units, individualized procedures, the experience unit, and flexible groupings in a continuous promotion program. Since a number of these methods are discussed in the final chapter of this book, this discussion will be limited to a treatment of the differentiated assignment and the mastery technique.

The Differentiated Assignment. This plan, as generally used, consists of the simple procedure of making the assignment for the group as a whole and at the same time of making optional assignments for those pupils who can do more work than the average. A more comprehensive use of it requires adjusting the material to three levels of difficulty. Some of the material of the assignment may be made suitable to those pupils who have less than average ability; some of it may be adapted to those of average ability; and some material may be prepared especially for those pupils who are above average in ability. Thus the assignment is differentiated for three groups of pupils. The shortest and easiest part of it may be called the minimum assignment; the other more extensive and difficult parts may be referred to as the optional assignments. Ordinarily, the differentiation is of a quantitative rather than a qualitative character. The problem of determining the difficulty of assignments is quite involved and, therefore, hardly possible of attainment without extensive experimentation. That is one difficulty in using the differentiated-assignment plan. Another difficulty arises in connection with evaluating the success of the pupils in doing the assignments. If, for example, one group of pupils is assigned the minimum amount of material to be covered in a given period of time, and another group is assigned the minimum amount plus optional assignments, how is the work of the pupils to be evaluated? Are all pupils to be given the same credit and rating for the successful completion of assignments regardless of the level of difficulty at which they are done? Perhaps this is a matter for the teacher and the principal or a committee of teachers to determine. It seems probable, however, that some definite policy of evaluating and marking the different assignments must be established.

The Mastery Technique. The so-called mastery technique requires adaptation of both materials and procedure. It becomes a remedial technique after the initial teaching of the subject-matter unit is

completed. In operation, the mastery technique presupposes that a suitable unit of subject matter has been selected and prepared for teaching. After the unit of material has been prepared in all its essentials, including study aids, practice exercises, and tests, the teacher begins with a pretest. On the basis of the findings of this test, he teaches and later administers a retest. From this point on, the technique becomes individual and remedial. If the subject-matter unit is not now mastered by most of the pupils, the teacher adapts the procedure and continues teaching until every normal pupil has adequately completed it. Since this plan does not require changes in the school organization, it can be readily used by the teacher in any subject. It does not replace individual techniques of instruction, but instead, emphasizes the need of such instruction in learning certain subject-matter units.

The writers are of the opinion that these formal methods of differentiation are on the wane. They reached their zenith of popularity some years ago and are now yielding to informal, flexible instructional groupings.

Other Informal Methods. Any enrichment of the program of studies and activities must be concerned with stimulating the social and physical growth of the children as well as their intellectual development. To this end the program must not only include extensive study of the subject-matter field but also include such activities as dramatics, music, nature study, and other projects. Obviously no program of activities in which children may engage is in itself sufficient to preclude failure. The evaluation of the various phases of their development must be regarded as important. Tests of subject-matter achievement must be supplemented by the judgments of teachers and supervisors, and probably of the parents and even the children themselves. The proper evaluation of each pupil's performance in very many functions will make more certain the chances of their promotion than is likely to occur under ordinary methods of marking and grading their schoolwork.

STUDY QUESTIONS

1. To what extent do first-grade children vary in their capacity to learn?
2. Why are some first-grade children unable to profit from instruction in reading?
3. What are several causes of individual differences?
4. What may be regarded as the most significant causes of individual differences?

5. In what functions do boys and girls differ most?
6. What is the most likely cause of the differences between boys and girls in these functions?
7. How does maturation influence differences among children?
8. What do correlations of mental traits among parents, children, and cousins reveal?
9. How constant is the I.Q. throughout life?
10. What is the evidence that the I.Q. changes?
11. What are several formal methods of providing for individual differences?
12. What are several informal methods of providing for individual differences?
13. What particular methods of providing for individual differences are most readily adapted to ordinary classroom work?

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Part Four

THE MEDIA OF TEACHING AND LEARNING

A large part of learning is linguistic. In order to acquire ideas, language is essential. The adult must use language constantly in order to instruct the young; and the young must utilize language in order to learn. Learning and teaching, therefore, are conditioned by, and consist in part of, gaining control over the language tools. Commonly the language of the school involves conversation, story-telling, discussion, reporting, recitation, dramatization, and reading. Each of these activities involves the use of special techniques in certain typical activities. It is necessary that the student of teaching and learning shall come into contact with these activities and learn the best ways of using them effectively.

In addition to the language tools certain newer media are now gaining acceptance under the general heading of audio-visual aids. These media have great promise and deserve special study by the teacher.

Part Four discusses these activities and the techniques employed in them in the light of newer practices. Successful control of these activities demands special knowledge and skill from the teacher. This knowledge and skill will be used constantly in directing the integrated activities of the school. At times, however, the teacher and pupils will make specific effort to improve their control of these techniques directly.

Chapter XXIII CONVERSATION AND DISCUSSION

A study of the history of communication among the peoples of the earth discloses many related forms of oral expression. These may be indicated as talking, conversing, discussing, arguing, debating, storytelling, lecturing, singing, laughing, weeping, crooning, yodeling, etc. It will readily be seen that some of these descriptive terms are merely synonyms of others, while a few of them are sufficiently different in their essential elements to permit of a distinct classification. The very fact that conversation and discussion have been so closely associated in common usage with many of these other forms of oral expression makes it somewhat difficult clearly to distinguish them from other forms without confusing the reader. While it will be conceded that conversation is a phase of a number of other forms of oral expression, it is believed to have enough distinct features of its own to justify treating it as a special type of learning activity. Discussion is a more serious form of conversation. As a means of acquiring information and of communicating ideas and experiences, these techniques deserve special study. In this chapter, some of the important aspects of these forms of oral expression will be considered.

Definition. Conversation is a tool both for learning and for imparting ideas. Webster's *New International Dictionary* defines conversation as an oral interchange of sentiments or observations. The difficulty with this definition is that it does not make a distinction between conversation and other forms of oral language ex-

pression, such as relating incidents, arguing, discussing, and storytelling. It may be defined as a friendly, informal discourse carried on between two or more individuals. In this discussion conversation will mean oral communication of one's ideas and experiences with others, or the exchanging of experiences between two or more individuals in an informal way. Discussion is a special form of conversation. It is an exchange of ideas of a more reasoned, detailed kind than that found in ordinary conversation and generally involves the consideration of important ideas, or issues. For practical reasons, however, we shall use the term conversation to cover both conversation and discussion in the remainder of this chapter.

Since large groups lessen the opportunity for every member of the group to participate, the number of pupils engaged in conversation or discussion at any one time should probably be limited to a comparatively small group.

Uses of Conversation. Conversation may be used for several purposes, depending on whether it is conceived as a means to an end as employed by the teacher, or as an end in itself as used by the pupils. As a teaching device, some of its functions may be to detect errors in speech, to reveal the size and quality of pupils' speaking vocabularies, to extend and refine language habits, to develop habits of listening, cooperation, and accuracy, and to carry on an interchange of thoughts during an informal visit. As an activity, the chief function of conversation is to enable children to share ideas and experiences with others, either as a means of recreation or for more serious purposes. In using conversation as a teaching technique, the teacher will find it helpful to keep the following guiding principles in mind. They are quoted verbatim from the *Twenty-fourth Yearbook*.¹

1. Provide abundant opportunity for pupils to talk freely about matters in which they are keenly interested.
2. Obtain freedom and spontaneity in speaking at all times. Avoid the restraint that results from frequent criticisms.
3. Provide real motives for speaking and genuine audience situations.
4. Encourage pupils to speak freely and naturally, at first in relatively short units, if necessary. Later aid them in presenting longer series of ideas in good sequence.
5. Encourage pupils to use whatever new words fit naturally into class discussions and activities.

¹ National Society for the Study of Education, *Twenty-fourth Yearbook*, Part I, p. 29.

6. Present good models of enunciation and pronunciation at all times.
7. Depend primarily on the imitation of right models in correcting and refining the speech habits of pupils.

These principles are as applicable to any other form of oral expression in which pupils are getting work and play experiences as to conversation. Which ones should be emphasized depends on the purposes of the conversation.

The Sources of Ideas. The subject matter of conversation is largely determined by the objectives set up. The subject should always be interesting and within the experience of children. It may deal with literature, history, geography, science, or any other school subject. The subject matter may be simple or technical. A fatal error is to attempt to direct conversation on subjects that neither teacher nor pupils know anything about. Such subjects as "our autumn games," "winter sports," and similar topics, do not seem very promising, but "Babe Ruth, a great ballplayer," might do. Furthermore, children feel freer to talk about those things which are closely allied with their experiences and needs. That has been shown in a study in which the author reports finding a very great many things which they talk about during the recess period.² Among these topics are games and sports, personal experiences, trips, families and friends, accidents, school, and parties. The younger children talk about more topics than the older children and ramble more while talking. In a study of children's free-conversation periods, Zyve³ reports that 27 per cent of their conversation is related to home play, 14 per cent to animals, 14 per cent to school, and 13 per cent to auto trips.

The custom of selecting fables and fairy tales exclusively for conversation, and of having children impersonate the characters, was formerly overdone. It was an interesting experience for very young children to impersonate conversational plants and animals, but these experiences are not of real life and are of only ephemeral interest. There is plenty of more significant and real material for conversation and discussion to be found in the child's daily life at home and at school. Greater use should be made of the following sources and types of materials:

² Dawson, M., "Children's Preferences for Conversational Topics," *Elementary School Journal*, Vol. 37 (1937), pp. 429-37.

³ Zyve, C. T., "Conversation Among Children," *Teachers College Record*, Vol. 29 (1927), pp. 46-61.

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|--------------------------------|----------------------------------|
| 1. Children's home environment | 2. Children's school environment |
| a. Animals | a. Books |
| b. Plants | b. Charts |
| c. Sports | c. Maps |
| d. Games | d. Sports |
| | e. Games |

It is very important that children be given an opportunity to select the topics for conversation, for they know best what they would like to talk about. They will talk or converse freely about the things in which they have had an abundance of experiences. The home environment is usually rich in topics for conversation among the younger groups of children. The school environment later offers enriched opportunities for conversational subjects. The advantage of this practice of employing the children's local environment for sources of materials lies in its stimulating effect on pupils' activities.

Making Conversation Interesting. True spontaneous conversation needs no artificial motivation. The conversation period should be concerned with the experiences and needs which are as real to children as those about which they talk in their play and various activities about the home. In their experiences out of school, children are interested in seeking the things they really want. They seem to find, make, or fall into situations outside of school which lead to natural conversation.⁴ Usually the desire to share their ideas and experiences with others leads pupils to tell the "news" to their classmates. All that is needed is a friendly audience.

One text⁵ reports that a fourth-grade teacher motivated a conversation lesson in the following manner:

How many of you have a canary bird at home? As she had expected and hoped, some had such a pet and others had not. She said, "Tomorrow, those who have a canary will have an opportunity to talk about it. In the meantime please think over what you would like to say that will interest those who do not have one."

This is a good example of the customary way of motivating exercises for children. It is scarcely detailed enough to be effective. More time is generally necessary to develop a real interest in a sub-

⁴ See Smith, Dora, "Growth in Language Power as Related to Child Development," *Forty-third Yearbook* (1944), National Society for the Study of Education, Part II, Department of Education, University of Chicago, pp. 77-9.

⁵ Kendall, C. N., and Mirick, G. A., *How to Teach the Fundamental Subjects*. Boston: Houghton Mifflin Co., 1915. Pp. 74-5. An old but standard work.

ject. One can readily see the value of such a motivating scheme, however, if sufficient time is taken to encourage children to talk freely about the subject for a few minutes before making an assignment for the next meeting of the class.

Another writer ⁶ says this about motives of work:

Are the things which the child is asked to do worth while for him? Can he see that they will mean something to him today, tomorrow, and later in life? Is he firmly convinced that he is engaged in profitable work or is he merely going through the motions because he must?

Suggestions for Improving Conversation.⁷ Conversation and discussion demand interest, spontaneity, and enjoyment on the part of the child if they are to be genuine. Only vital subjects will induce reality in making a conversation interesting. The following suggestions ⁸ may help teacher and pupils to improve conversation:

1. Converse about what has been read in different fields: history, literature, science; current fiction and poetry; literature of special interest; topics of the day.
2. Know magazines which deal with specific subjects in an interesting way; know where to get current books and poetry.
3. Know how to use good stories, anecdotes, and illustrations, and how to use references and magazines which contain good stories and joke pages.
4. Relate travel experiences.
5. Report to friends any interesting observations or experiences dealing with people, scientific facts, art, processes of construction, games, sports, fairs, a circus, plays, exhibits.
6. Quote sayings of interesting characters, descriptions of people and places, incidents and passages from history or literature.
7. Retell interesting portions of lectures and conversations.
8. Know how to raise certain questions with friends; know something of their interests and guide the conversation accordingly; obtain the participation of strangers by an attitude of friendliness and by introducing topics about which they may wish to talk.

Preparing for Conversation and Discussion. A conversation lesson is ordinarily a language exercise used chiefly for the purpose of improving the pupils in the art of communication; but obviously, conversation cannot be engaged in apart from some subject to converse about. The lack of an adequate subject has sometimes led to very

⁶ Yoakam, G. A., *Reading and Study*. New York: Macmillan Co., 1928, P. 454.

⁷ See Smith, Dora. *Forty-third Yearbook* of the National Society for the Study of Education, op. cit., pp. 77-9.

⁸ Fourth Yearbook. Department of Superintendence, Washington: p. 243.

artificial and unreal situations. If a conversation is to be indulged in for the sake of the enjoyment alone, it is clear that an assignment may or may not be necessary. In the primary grades where the teacher is to develop language expression among children who have little or no language ability, conversation is best when it is informal and arises out of some activity or interest of children. To say to children, "Now we are going to have a conversation lesson; find something to talk about" is a poor assignment. It is better to seize upon opportunities for spontaneous expression when they arise.

In the middle and upper grades, pupils may take an interest in improving their powers of conversation and discussion. In that case, many opportunities for exercise of conversational ability are present in all school subjects, but particularly in literature, history, geography, and science. Sometimes an assignment of a subject or topic may be made; pupils may prepare for conversation by reading an investigation, or they may simply be instructed to organize what they already know for conversational purposes. At other times out-of-class work may deal with such matters as looking up correct pronunciations of words, practicing the grouping of ideas in sentences and paragraphs, and in other ways improving skill in expression of this sort.

Incidental practice in conversation is a by-product of many activities in school and out, but it can scarcely be said that the assignment in such cases is for conversation. It is rather that conversation is a valuable tool of communication which finds its use in all types of school subjects and situations.

An example of discussion in which an assignment is developed follows:

WHY FARMERS ARE MORE PROSPEROUS IN ILLINOIS THAN IN VERMONT

Teacher: Here are a number of photographic views which I took of farm homes in Illinois and Vermont several summers ago.

Student A: I have seen some pictures like these before. My uncle lives on a farm. He has cattle, hogs, chickens, and horses. I am going to visit him after school is out.

Student B: Some of these homes are nicer than others. There are more buildings in this picture than in that one, and there are more animals.

Student C: Perhaps some farmers have more money to do things with than others.

- Teacher: In Illinois, farmers grow a great deal of corn to fatten cattle and hogs for market. They ship both corn and livestock to Chicago in exchange for money. Many carloads of grain and farm animals are sent to market each week. In Vermont, farmers do not sell many cattle and hogs, and they grow little corn. Farms in these two states vary considerably in size.
- Student C: We drove out into the country one day, and I saw some farm animals and grain growing in the fields. Daddy said that farmers grew grain to feed cattle and hogs and other livestock.
- Student A: My uncle sells chickens and eggs, and I think he sells hogs and cattle, too.
- Student D: If I lived on a farm, I would grow big fields of grain and have lots of farm animals.
- Student C: I would want a good farm if I lived in the country.
- Student A: I believe I would sooner live on an Illinois farm than on a farm in Vermont.
- Student B: I think I would, too.
- Teacher: We shall have to find out why farm homes are better kept up in Illinois than in Vermont. If farmers in Illinois have more money to do things with than farmers in Vermont, we might find out the reason for this condition. We might find out something about the size of the farms in Illinois and Vermont. Then we might find out about the kind of crops grown; where they are sold; how much the farmers get for their crops, farm animals, etc. So, for our next lesson, we shall read pages 29-40 of our reference book (there should be specifically stated) and find out how large farms are in Illinois and in Vermont; how many bushels of grain are grown in each state; and how much money the farmers get for their grain. Then we shall be able to decide which state is really better for farming.

This assignment can be enlarged upon at each subsequent meeting of the class until children become fully aware of the reasons why farmers are likely to be more prosperous in Illinois than in Vermont. It is more or less obvious that a conversation of this type can be so directed by the teacher that children's interests and needs will become vital factors in getting the proper sort of orientation in the problem or project. An informal conversation aids the pupils to get the problem in mind, to get started upon its solution. It arouses an active interest in searching for information and in planning activities. It is also the typical mode of assignment in many school activities.

Profitable Class Activities. Since conversation as a teaching activity has been and is inextricably associated with all other types of

activity, it may be difficult to conceive of it as a separate and distinct method of conducting a recitation; but when the major activity of the recitation consists predominantly of conversation the recitation may be labeled accordingly. Naturally, the question arises, "How is the activity to be initiated and kept going?"

Conversation may be initiated either by the teacher or by the pupils. In either case, it may begin with the telling of a story, the statement of a problem, or the showing of a picture or a film. The manner of beginning will depend on the purpose of conversation. Since conversation should function with the children as a means of relaxation or as an end in itself, the teacher may initiate pupil activity by relating some interesting experience which is more or less common to the group. Since, in this particular instance, the social value of conversation is to be emphasized, there need be no serious planning of activities. Children will be permitted to talk freely about such activities as they find or create in their play and miniature business transactions out of school. If the conversation is intended as a preparation for a definite activity of a work type, there will be need for serious planning on the part of both teacher and pupils. Usually, however, conversation of either the social or work type furnishes many "leads" to activities of a factual nature. This is well illustrated by the fourth-grade teacher⁹ who continued the conversation recitation on the canary birds as follows:

The next day in the language lesson period three pupils who had canary birds and three who had not were invited to take seats in the front of the room. The teacher joined the group and began the conversation by remarking that when she was a little girl, she had a yellow-and-white canary that sang very sweetly. The children took up the teacher's thought and talked very naturally for about five minutes with very little guidance. This conversation formed the basis of blackboard composition, worked out by the class in the same period, and this in turn was a model for a written paragraph at a later time.

It will be noted at once that this conversation on canary birds has not only social value but also work value in that it initiates further study of a purposeful character.

The conversation, once begun, may take the form of modified dialogue. That is, only one pupil talks at a time. Others listen atten-

⁹ Kendall, C. N., and Mirick, G. A. *How to Teach the Fundamental Subjects*. Boston: Houghton Mifflin Co., 1915. Pp. 74-5.

tively so as to be able to pick up the conversation at an opportune moment. There should be no formal way of "breaking in" on the one who is talking. Conversation must be informal and, while pupils must understand that they are not to interrupt the speaker, they should not be required to assume the listening attitude altogether. Some pupils will monopolize the entire period if guidance is not judiciously given by the teacher. Pupils should be made to see that conversation is a cooperative enterprise in which all are to take an active part.

In the preceding section, an example was given of conversation in preparation for a definite activity of a work type. The following example will illustrate the social conversation.

Teacher: Did any of you hear or read about the latest news?

Student A: Yes, I heard a man say that a circus was coming to town. It will be here in two weeks, maybe.

Student B: I saw some pictures on a billboard advertising the circus. There were pictures of wild animals, clowns, horses, etc. It said the show would be here in June.

Student C: Will we get to go to the circus?

Teacher: Well, I do not know. We must first find out what day the circus will be in town. If it comes on Saturday, probably your father or mother will take you. If it comes on a school day, we may arrange our work so that we can go. But we must first find out the exact date of the circus before we make any plans.

Student A: I went to see a circus one time. It was last year. I saw lions, tigers, elephants, and many animals. There were clowns who were painted up and they had clubs, umbrellas, and all kinds of funny things. One clown had a toy gun and pretended he was hunting rabbits.

Student D: I wonder where they get all the wild animals and nice horses. I heard Uncle John say that the owners of the circus bought them somewhere.

Student B: They get them shipped in from other countries. But they can get the horses here at home.

Student C: I went to a zoo one time and saw all kinds of wild animals. Maybe they get them from the zoo.

Teacher: No, circus owners do not get their wild animals from the zoo. They buy them in foreign countries, and sometimes they raise their own.

Student E: I wonder where circus performers sleep. I suppose they sleep in tents as we do when we go camping.

Student C: I heard Daddy say that they sleep on the train when they are moving from one town to another, and they finish sleeping during the next day while the working men put up the big tent for the next performance.

Student D: I saw them put a big tent up when Barnum-Bailey and Ringling Brothers Circus came to town. It was an interesting sight.

Student B: I would like to know how they make such a big tent.

Teacher: Well, it takes a great deal of material to make a tent as large as some of them are. We could find out about some of these interesting things of circus life if we read certain books and asked questions of those who know.

There is really no limit to the interest which children will take in such a conversation. Since this was to illustrate a conversation having purely social value, no special attempt was taken to direct the conversation so that leads to purposeful activities would be suggested. However, it is almost impossible to prevent such leads from being suggested.

There are pitfalls in this form of activity as in other forms. If the teacher is not actively alert, there will be frequent wanderings in children's conversation. They are likely to digress a great deal without a leader. It is common knowledge that some teachers do not seem to care what happens in the recitation so long as pupils are mentally alert and active. This is the wrong attitude to take, regardless of the objective of the conversation. One might see some justification for slight wandering in an informal talk, but as a rule pupils should be held to a definite contribution in the work type of conversation. There is the danger that habits of lazy thinking and rambling talk will result from unguided chattering.

Appraisal of Results. The purpose for which conversation is used determines whether it should or should not be measured. If conversation is employed as a language exercise, that is, to detect errors in speech, a check should be made by close observation on the part of the teacher; or he may have the pupils listen for language errors made in their conversations. If, on the other hand, the purpose of conversation is to enjoy a social period together, there is no need of checking on the specific language errors of children. In fact, this practice would defeat the purpose for which the activity was held. Effective measurement of children's conversational powers, if made at all, must be done with a check list and observation or by means of stenographic reports or mechanical recording devices. In the absence of the latter techniques, careful observation by the teacher is useful.

Desirable and Undesirable Outcomes. A good conversation or discussion draws on children's imagination, memory, and power to do

reflective and creative thinking. It gives them opportunity for creative expression and the interchange of ideas. It may be delightfully informal and intimate and rich in the discovery of new ideas. It is a fundamental type of human activity worthwhile for its own sake. Discussion furnishes a setting for the development of right attitudes of work, habits of listening, expressing ideas, and overcoming the self-consciousness so often found among children of the upper grades. In fact, it is the basis of the socialized method and indispensable to it. It results in improved habits of speech and thought. It must not be overlooked, however, that some undesirable outcomes may result from a poorly conducted conversation hour. There probably is no greater opportunity in any other type of lesson exercise for pupils to ramble and chatter about nothing in particular than in a carelessly guided conversation. Also, lack of attention to correct forms of speech and to effective modes of expression may cause little or no progress to be made in improving this phase of the art of communication.

STUDY QUESTIONS

1. To what type of learning activities does conversation belong?
2. Why might it be objectionable to limit conversation to the common experiences of a group of pupils?
3. What are two functions of conversation?
4. What might be the objection to using fables and fairy tales exclusively in children's conversations?
5. To what extent are conversation and discussion valuable means of developing different learning activities?
6. How might conversation be effectively initiated with a group of children?
7. What are several pitfalls which the teacher must guard against in conducting a conversation or discussion?
8. In what ways may conversation contribute to valuable social habits?
9. What are several realistic stories in which the communication of ideas is largely through conversation?

SELECTED REFERENCES

1. DAWSON, M. "Children's Preferences for Conversational Topics," *Elementary School Journal*, Vol. 37 (1937), pp. 429-37.
Finds that young children talk about doing things rather than about persons and ideas. Older children converse about fewer topics than do younger children and ramble less.
2. LANE, R. H. *The Teacher in the Elementary School*. Boston: Houghton Mifflin Co., 1941. Pp. 231-34.
Discusses incidental conversation and its function in a social group.

3. PRESSEY, S. L., AND ROBINSON, FRANCIS P. *Psychology and the New Education, revised*. New York, Harper & Bros., 1944. Pp. 139-41.

Refers to the fact that there has been little research on conversation.

4. YOAKAM, G. A., AND SIMPSON, R. G. *Directed Study and Observation of Teaching*. New York: Macmillan Co., 1934. (Revision in preparation.)
Contains related exercises.

5. ZYVE, C. T. "Conversation among Children," *Teachers College Record*, Vol. 29 (1927), pp. 46-61.

Contains stenographic reports of daily free-conversation periods in the schoolroom.

The art of storytelling was handed down to historic peoples from the remote period of the past. Prehistoric records on the walls of the caves of the Stone Age testify to an already developed ability to relate stories. Folk tales, fables, myths, legends, and hero stories constitute an important part of the ancient narratives of the world. The universal use of the story today and the almost instinctive delight of children in a tale well told would seem to testify to the long use of stories among ancient peoples. In the form of fiction, motion and sound pictures, radio, and drama the story has widespread use today. It is a universal means of entertainment and recreation upon which schools have seized avidly as a relief from less natural and effective types or modes of communication. As with other forms of natural expression, the school has sometimes misused storytelling and tried to make it a means toward an end rather than an end in itself. The good story is an end in itself; the activity of storytelling justifies itself and needs no extrinsic motivation.

The Use of Storytelling as a Device. Educationally, listening to stories is a practical means of learning interesting things in interesting ways. The use of the story in reading and language, in history, in biography, and in the natural sciences is almost universal. It is used as a means of arousing interest and enthusiasm in many of the abstract school subjects in which intrinsic interest is often lacking.

The story in itself needs no such justification. It can be justified for its recreational values alone, although often it has been thought of by teachers solely as a device for teaching facts or developing

skills, a sort of royal vehicle for the painless dissemination of knowledge or information unpalatable when presented for its own sake. This is a misuse of storytelling. If a story points a moral, well and good; if it improves language habits, so much the better; but the story must, first of all, be a good story and storytelling must be worthwhile for its own sake. It is an advantage for every teacher to learn well the art of storytelling.

Storytelling an Art. Storytelling is an art. A story is narrative; that is, it tells what has happened, either in real life or in the imagination of the maker or the storyteller. It is a story of real life, as in history; or it is a story of an imaginary life, as in fiction. In order to carry on the art of storytelling successfully, the storyteller either must understand and appreciate the stories of others well enough to reproduce them effectively, or he must exercise his creative imagination and make plots of his own, that is, construct an interesting plan for a story and then unfold this plot in a fashion which will create interest and suspense in the mind of the listener or reader. The ability to create original stories is a rare gift, but the ability to tell the stories of others effectively is more common and may be learned by anyone who wishes to teach.

Qualifications of the Teacher. The qualifications necessary in order that the teacher may become a good storyteller include ability to locate and select good stories, to understand and interpret them effectively, to memorize the story or to read it effectively, and to use skillfully his personality to enrich and give effectiveness to the tale. The storyteller is, in a way, an actor. He interprets the words of the author through his facial expression, the use of the tones of his voice, and his gestures. Effective dramatic reading is an art that must be learned. The teacher may well practice the art.

Two Types of Storytelling. Storytelling in the school is of two types: (1) that in which the teacher is the teller and the children are the audience; and (2) that in which the children are narrators and the teacher and fellow pupils are the audience. The teacher needs to teach the children all he knows about storytelling and in addition to develop among them the true audience spirit, for all storytellers need audiences. If there were no audiences, there would be no storytellers.

Two Major Functions of Storytelling. Storytelling is often employed by the teacher as a means of attaining certain desirable results in learning. By the pupils, it is used as an end in itself. As a device

used in teaching, storytelling when properly used, is a valuable method of creating interest and enthusiasm in schoolwork. As an end in itself, its chief purpose is to contribute enjoyment to a pleasant social hour. The pure joy of telling and listening is a strong motive for children to engage in storytelling experiences.

The story is used by the teacher for numerous purposes, among which may be mentioned checking habits of expression and deficiencies in the use of oral language, but these are merely subordinate to the larger function of enabling children to enjoy good stories and interesting experiences for their own sake. In the primary grades, the main function of the story is to give children practice in organizing a simple series of experiences and in relating them to a sympathetic audience. In the intermediate grades, in addition to its use as entertainment, it provides opportunities for the teacher to check on some deficiency in oral expression, to give a background of experience for the study of certain school subjects, or to perfect the language skills involved in storytelling. In all grades, storytelling may be effectively employed to arouse interest in subsequent activities. It is highly desirable and valuable in initiating new assignments.

From the point of view of the children, storytelling is simply an enjoyable experience worthwhile for its own sake. They learn by imitation to tell original stories and to be effective in telling the stories they hear and read. This practice has a social significance to children. They enjoy telling and listening to stories as a social pastime. They cultivate the art of storytelling without being made too self-conscious of the technique involved.

True and Imaginative Stories. An investigation of the stories told to children in schools reveals the fact that they have been largely of the imaginary type, such as fairy tales, Mother Goose rhymes, fables, myths, and simple imaginative narratives. The supposition has long been that the imagination can be most effectively trained through the use of stories; but, while the importance of the fictitious story should not be underestimated, it need not be so exclusively employed that real stories find no place in the training of children's appreciation for the real things of life. The basis on which stories should be selected is, most obviously, children's needs and interests. Some stories ought to be of the fantastic type; others of the realistic or natural type. Each has its advantages in rounding out children's experiences. Usually, make-believe stories find a

preference with very young children, while stories of real life and adventure make their appeal to older children. However, older children and adults also enjoy folk tales and similar stories in which there is an element of mystery and the supernatural.

Guides to Good Stories. There is really no need for the modern teacher to guess at what stories should be used in any particular grade of the school, since there is considerable evidence of an objective character to guide him in his selection of suitable materials for storytelling. It is an interesting experience for the teacher of literature to compare the investigations giving children's actual preferences for stories and reading materials recommended by those who were inclined to take children's likes for granted. Such studies as are here indicated give an interesting and illuminating compilation of materials representing children's tastes in reading.

One of the most illuminating studies of children's reading interests in recent years is Lazar's, *Reading Interests and Activities of Bright, Average and Dull Children*¹ which shows the popularity of certain new as well as old stories for children. The volume, *Gateways to Readable Books* by Strang² and others is typical of numerous guides to reading for children. Such collections as those of Huber³ indicate the sources of stories for children of both classical and modern origin. The teacher should make frequent use of magazine reading lists and the reading lists of the American Library Association. While these studies and investigations are primarily concerned with children's reading tastes, yet they indicate the kind of story materials in which children have an unusual amount of interest. They suggest the importance of newer types of materials for children's stories.

Types of Materials. It is somewhat difficult to make a satisfactory classification of storytelling materials, for there is considerable overlapping of the division of any classification which one may attempt to make. Usually, however, two types of materials are more or less obvious; namely, (1) the purely recreational and (2) the informational or work type. To this classification may be added those materials which are both recreational and informational or factual. The

¹ Lazar, May. *Reading Interests and Activities of Bright, Average and Dull Children*. New York: Bureau of Publications, Columbia University, 1937.

² Strang, Ruth, et al. *Gateways to Readable Books*. New York: The H. W. Wilson Co., 1944.

³ Huber, Miriam Blanton. *Story and Verse for Children*. New York: Macmillan Co., 1940.

recreational type of materials include some stories in which the element of information is present. Their chief purpose is to supply the learner with the facts about the world in which he lives, while providing him with entertainment. For purposes of illustrating these three types of materials, a sample classification of titles is suggested below.

SAMPLE TITLES OF STORIES WHICH ARE PRIMARILY USED FOR
RECREATIONAL PURPOSES ⁴

1. Mother Goose Jingles and Nursery Rhymes
 - a. Jack and Jill
 - b. Three Blind Mice
 - c. Higgledey, Piggledey
 - d. Hey Diddle Diddle
 - e. Taffy Was a Welshman
2. Traditional Fairy Stories
 - a. The Old Woman and Her Pig
 - b. Henny Penny
 - c. Jack and the Bean Stalk
 - d. Cinderella
 - e. Drakestail
 - f. The Tongue-Cut Sparrow
 - g. The Straw Ox
3. Modern Fairy Tales
 - a. The Emperor's New Clothes
 - b. The Nightingale
 - c. The Tinderbox
 - d. The Ugly Duckling
 - e. The Happy Prince
 - f. The Knights of the Silver Shield
 - g. Old Pipes and Dryad
 - h. The King of the Golden River
4. Fables and Symbolic Stories
 - a. Androcles and the Lion
 - b. The Hare and the Tortoise
 - c. The Fox and the Grapes
 - d. The Dairywoman and the Pot of Milk
 - e. The Whistle
 - f. The Vision of Mirzah
5. Myths
 - a. The Miraculous Pitcher
 - b. The Narcissus
 - c. Icarus and Dædulus
 - d. Thor's Visit to Jotunheim

⁴ Titles adapted from Curry and Clippinger, *Children's Literature*. Chicago: Rand McNally & Co., 1920.

6. Narrative Poetry
 - a. The Leak in the Dike
 - b. The Swing
 - c. The Raggedy Man
 - d. Casabianca
 - e. The Lay of the Last Minstrel
7. Romances and Legends
 - a. Ali Baba and the Forty Thieves
 - b. Don Quixote
 - c. King Arthur and His Knights
 - d. Aladdin and the Wonderful Lamp
 - e. Sinbad the Sailor

SAMPLE TITLES OF STORIES AND FACTUAL MATERIALS WHICH MAY BE
USED FOR BOTH RECREATIONAL AND INFORMATIONAL PURPOSES

1. Realistic Stories
 - a. The Big Bear
 - b. Eyes and No Eyes
 - c. The Good-Natured Little Boy
 - d. Waste Not, Want Not
 - e. Jackanapes
2. Nature Stories
 - a. Johnny Chuck Finds the Best Things in the World
 - b. Bird Habits
 - c. Wild Life in the Farm-Yard
 - d. Insect Life
 - e. The Story of a Salmon
 - f. Moti Guj—Mutineer
3. Biography and Hero Stories
 - a. The Boyhood of Washington
 - b. The Boy's Life of Mark Twain
 - c. Franklin's Autobiography
 - d. In the Western Wilderness
 - e. Heroes of the Air
 - f. The Wonder-Workers
4. Geography and Travel
 - a. Working My Way Around the World
 - b. Kim
 - c. The Call of the Wild
 - d. Lorna Doone
 - e. Peeps into Many Lands
 - f. Peeps at Great Cities
 - g. Wilderness
5. History
 - a. The Last of the Mohicans
 - b. The Story of Mankind

- c. A Tale of Two Cities
- d. From the Deep Woods to Civilization
- e. When Knights Were Bold
- f. The Enchanted Past
- g. Plutarch's Lives
- h. The Oregon Trail
- 6. Sports and Amusements
 - a. Shelters, Shacks, and Shanties
 - b. Football without a Coach
 - c. The Book of Magic
 - d. Three Hundred Games and Pastimes

SAMPLE TITLES OF CHILDREN'S BOOKS WHICH ARE PRIMARILY USED FOR
INFORMATIONAL PURPOSES ⁵

- 1. Occupations and Handicrafts
 - a. Things Worth Doing and How to Do Them
 - b. Practical Things with Simple Tools
 - c. Home-Made Toys for Girls and Boys
 - d. Practical Basket-Making
 - e. Boys' Book of Model Boats
- 2. Applied Science
 - a. Pick, Shovel, and Pluck
 - b. The Wonders of Chemistry
 - c. Every Boy His Own Mechanic
 - d. Automobiles
 - e. Trains, Tracks, and Travel
- 3. Physiology and Hygiene
 - a. The Daily Dozen
 - b. Yourself and Your Body
 - c. The Efficient Life
 - d. Clothing and Health
 - e. The Child's Day
- 4. Vocations and Industry
 - a. The Worker and His Work
 - b. The Story of Sugar
 - c. Careers of Danger and Daring
 - d. Under the Big Top
 - e. How the World Is Housed
 - f. How the World Is Clothed
 - g. How the World Is Fed
- 5. Gardening
 - a. Our Garden Flowers
 - b. Garden Flowers of Spring
 - c. The Beginner's Garden Book

⁵ Adapted from Gardner and Ramsey. *A Handbook of Children's Literature*. Chicago: Scott, Foresman & Co., 1927.

- d. Garden Flowers of Autumn
- e. Garden Flowers of Summer

Any such classification of materials as is indicated above must necessarily be incomplete, for the reason that many textbooks contain the work type of material organized in story form. History, geography, general science, and other elementary school materials of the content type are sometimes written in story form in order to make interesting reading; consequently, it is difficult to classify them into well-defined divisions. For practical purposes, the classification given here will be found useful.

Interesting Pupils in Storytelling. Good stories are sufficiently interesting in themselves to obtain and hold the attention of children. The elements of excitement and suspense are strong motives for reading and listening to stories. Good stories are generally full of action and rich in material for the imagination. They speak for themselves. Poor stories die of their own weakness. If the teacher is skilled in selecting good stories and knows the art of maintaining interest to the end by observing the fundamental principles of good storytelling, children imitate the practice, learn the technique, and come to enjoy storytelling. The content of the story also is an important matter in arousing children's interest. Every word and sentence should be full of action, for activity is interesting to children. It is a part of their life. Appeal to curiosity and mystery is a powerful influence in securing children's attention, although the presence of an element of mystery is not necessarily the chief criterion for the selection of a story. Adventure stories, animal stories, and plain simple tales of human experiences carry their own appeal to children. More use might well be made of stories of the latter type.

Familiarity with a few simple rules of selecting and telling stories will prevent the storytelling period from "going flat" or from becoming a total failure. These principles are:

1. Select stories rich in detail.
2. Select stories full of action words and sentences.
3. Select a few highly imaginative stories.
4. Select stories from children's experiences.
5. Select animal, bird, insect, plant, and rock stories.
6. Select stories of adventure.
7. Make the story fit the occasion.
8. Understand children's limitations in comprehending stories.
9. Use simple, forceful language.

10. Tell the story straight through without stopping.
11. Employ direct style as much as possible.
12. Have the story end effectively.

Directing Seatwork and Homework Activities. The nature of the assignment in storytelling depends on whether or not it is to be chiefly a teacher's or pupils' enterprise or both. If the purpose of the recitation period is to give children literary experiences and at the same time to have them enjoy a social hour, the assignment may be omitted. If, on the other hand, children are to prepare stories for later telling, the assignment is necessary. In this instance, the teacher should have children help to plan the program of stories, select the stories to be told, and begin the preparation of stories. It frequently happens that children learn many of their stories without any previous preparation. They pick them up in the class after having heard them repeated by the teacher or other pupils, or they may learn them incidentally at home from the radio or phonograph, parent or other relative. In fact, this is the way children learn most of the universally known stories so familiar to all of us. Therefore, most often all that is needed in the way of assignment is merely the setting of an hour for storytelling.

When stories are to be composed from children's experiences, the activity will become a more serious matter. It becomes a time for purposing and planning, for composing and writing up experiences, and for evaluating and organizing them into coherent units. In this instance, the activity becomes a cooperative enterprise between the teacher and the pupils. This practice is valuable in developing creative ability. It should be encouraged much more than it is.

Conducting Class Activities. The nature of the organization of the recitation for storytelling activities depends largely upon the plan of work to be undertaken. If the recitation is to be used to create stories from children's experiences or to practice learning them for social or other purposes, there will be no need for any special form of class organization other than that which is necessary for carrying on informal group work. If, on the other hand, the recitation is to be devoted to telling and to listening to stories already composed, the organization of the class should be such as to encourage the best conditions for speaking and listening. Many teachers favor the plan used by the early Hebrew teachers in telling the parables and legends of the *Mishna* to their children. The effect of having chil-

dren grouped in a semicircle about the teacher or person interested in telling the story tends to increase their interest and enthusiasm for the storytelling activity.

When the class activity becomes a period of creative endeavor, children engage individually in selecting and organizing their experiences into simple stories. This practice has many values for children. They learn to compose, to write, to evaluate, to organize, to spell, to pronounce, to articulate, and to do skillfully many other specific activities essential in learning. Usually, however, the recitation is employed for purposes of training children in the art of telling stories rather than in composition. Its function, in this respect, is chiefly to provide sufficient practice for children to learn how to tell and listen effectively. In no other way can children economically learn the technique involved in storytelling than through constant practice under careful guidance of the teacher. Good models, examples, illustrations, and demonstrations are very essential, for children learn much of the technique of storytelling through observation and imitation as well as through practice. In order that they may have the most favorable conditions for learning good stories and for telling them effectively, the teacher should have at his command a few guiding principles in the art of storytelling. A number of these were indicated in a previous section.

The Test of Effective Storytelling. Since the main function of storytelling is to entertain, any attempt to measure success by administering a test would defeat the purpose of the activity. The reaction of the listeners will serve as a measure of success. If an interesting story is well told, it will please the audience. In the final analysis, the teacher is usually the judge of the success which children attain in telling stories. If, however, storytelling involves, in addition to the telling feature, composing stories from children's experiences, the appropriate test is a written or oral story. A check list, such as the following, will make pupils conscious of the factors which are essential in good storytelling.

A STUDENT'S CHECK LIST FOR JUDGING AN ORAL STORY

Directions. Draw a circle around "YES" if the pupil telling the story was clear on a certain point; draw a circle around "No" if he was not clear.

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| 1. Did the pupil mention the title of the story? | YES | NO |
| 2. Did he tell the story to entertain you? | YES | NO |
| 3. Did you enjoy it? | YES | NO |

- | | | |
|---|-----|----|
| 4. Did he tell the story to give you information about some object, person, or thing? | YES | NO |
| 5. Did you understand the story? | YES | NO |
| 6. Could you act out anything that was said? | YES | NO |
| 7. Could you make pictures of what was said? | YES | NO |
| 8. Did you appreciate the story? | YES | NO |
| 9. Was it about animals? | | |
| 10. Was it about adventure? | | |
| 11. Was the story suitable or appropriate for the occasion? | YES | NO |
| 12. Did you ever hear the story before? | YES | NO |
| 13. Was the story taken from a book? | YES | NO |
| 14. Was it made up from the pupil's own experiences? | YES | NO |
| 15. Could you tell whether he omitted any part of the story? | YES | NO |
| 16. Was the story very interesting to you? | YES | NO |
| 17. Was it funny? | YES | NO |
| 18. Was the pupil enthusiastic about telling the story? | YES | NO |
| 19. Was he in a hurry to get through with the story? | YES | NO |
| 20. Did he make any mistakes in pronouncing words? | YES | NO |
| 21. Did he make any mistakes in using words? | YES | NO |
| 22. Did he use many "ands"? | YES | NO |
| 23. Could you write out what the story was about? | YES | NO |
| 24. Could you get up before the class and tell the story as you heard it told? | YES | NO |
| 25. Did you like the way the story was told? | YES | NO |
| 26. Would you like to hear another story just like the one you heard? | YES | NO |
| 27. Did the story teach a lesson? | YES | NO |

Educational Outcomes. A good story well told makes a strong appeal to children's interest. A teacher who has developed considerable ability in telling stories can do much toward vitalizing schoolwork for children. Experiences in listening to and telling stories should develop among children the spirit of cooperation and other qualities so necessary in socialized living. Good storytelling should result in the development of desirable language habits among children. Stories should linger with children after they leave school. A few of the world's most highly prized stories should be familiar to all. The common possession of such a literary heritage tends to strengthen the ties among the members of the human race.

STUDY QUESTIONS

1. What are the characteristics of good stories?
2. What are the abilities required to tell stories effectively?
3. What other functions may storytelling serve other than that of initiating projects or units?

4. What are several subjects in which materials for interesting stories may be found?
5. What are the advantages to children in choosing materials for stories from their experiences?
6. What are the objections to the exclusive use of make-believe stories?
7. What are the advantages of using real stories instead of unreal ones?
8. What are several real stories which children may learn for purposes of entertainment?
9. What is meant by the informational type of story?
10. What are several informational or work type stories?
11. What are the elements in a story which tend to create suspense?
12. How may suspense be maintained in telling stories to children?
13. How may creative endeavor be encouraged by storytelling?
14. What is the value of an audience situation in telling stories?
15. How may children be trained to be effective listeners?
16. How would you attempt to measure the success of effective storytelling?

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Chapter XXV DRAMATIZATION

Dramatization has for a long time been one of the natural and spontaneous activities of the school. Teachers have commonly employed it to lighten an otherwise dreary day. Dramatic action appeals to children because of their tendency to imitation and mimicry. Schools have often misused dramatization in order to attain indirectly some end which could not easily be achieved by other means. Subjects and events which lend themselves poorly to dramatization have often been approached from the dramatic point of view when they should have been approached from another angle. But in spite of this misuse of dramatization, it has on the whole been better used than many other of the school activities.

The Nature of Dramatization. Dramatization is depicting, through bodily action, the characters, movements, and activities of a story or play. It proceeds through the use of language accompanied by facial expression, gesture, and movement or action. It attempts to tell the story in a more vivid manner than by word alone, and to enrich the appeal of the play through the addition of the pictorial element found in the movement of speaking characters across the stage. The action is further supported by the setting. All these elements add to the reality of the story and increase its appeal to the emotions and to the appreciation of the beautiful. Dramatization reproduces more nearly the reality of life than the cold characters of the printed page. Because of its concrete appeal to the sense of sight particularly as well as to the sense of hearing, and because of the bodily action involved, dramatization makes a special appeal to children. It is a concrete form of play which they can under-

stand and into which they can launch with wholehearted joy when it is properly organized and carried through.

When dramatization goes on without words it becomes pantomime. Plays without words, too, appeal strongly to children. Their natural love for mimicry and their tendency to manipulate things and to try to express through bodily action ideas and feelings, make pantomime especially appropriate for them. The recent interest in puppet plays revives an old form of dramatization which is much loved by children, young and old.

Dramatization Intrinsically Valuable. Dramatization as a school activity has been one of the few concessions made by the authoritarian adult group to the natural interests of children. It is worthwhile for its own sake. If through it certain educational values are achieved in the way of training in language expression and in physical grace and skill, these by-products are gifts of the gods and should come as an overflow from the measure of good which is inherent in dramatization itself.

Probably the greatest value of dramatization to pupils is derived from the opportunity which it gives them to clarify thought through their attempts to reproduce the action of a story, to derive the meaning of words from action, and to enjoy the emotional release which it offers through both forms of expression. To feel a beautiful emotion and to attempt to express it through words and action is a type of vivid experience of which children have had all too little in the schools of the past.

Forms of Dramatic Activity. In schools, dramatization takes on many forms, ranging from the simple attempts of the primary or kindergarten tot to depict the action of *The Three Bears* to the rather underdone attempts of the graduating class to "put on" *A Midsummer Night's Dream*. Among the different forms of dramatic activities which are common in the schools are the following:

- | | |
|-----------------|--------------------|
| 1. Pageants | 9. Crusades |
| 2. Plays | 10. Fairs |
| 3. Pantomimes | 11. Bazaars |
| 4. Operettas | 12. Contests |
| 5. Parties | 13. Entertainments |
| 6. Celebrations | 14. Programs |
| 7. Campaigns | 15. Festivals |
| 8. Exhibitions | 16. Debates |

A Suggestive List of Dramatic Activities. *The Twentieth Yearbook, Part I*, of the National Society for the Study of Education is espe-

cially rich in suggestive dramatic activities for teachers. Activities such as the following are commonly found in the programs of schools on visiting day and at other times. The only danger in the use of such activities is that the teacher may overformalize them and do most of the thinking about them himself. The best dramatizations are those planned and carried out by the children.

TWENTIETH YEARBOOK LIST OF DRAMATIC ACTIVITIES

1. An Arbor Day Pageant
2. A Musical Contest
3. A Robert Louis Stevenson Program
4. A Pantomime of a Fairy Scene from *A Midsummer Night's Dream*
5. A Better-Speech Crusade
6. A Health Play
7. A Stay-in-School Campaign
8. A Hallowe'en Party
9. A School Fair
10. A Dramatization of the Courtship of Miles Standish
11. A Debate: *Resolved*, that Achilles Was Braver than Hector
12. An Operetta: Fairy Flowers
13. A Japanese Festival
14. An Indian Entertainment
15. A Columbus Day Program
16. A Zone Exhibit
17. A Kite Tournament
18. A Valentine Party
19. An Oriental Bazaar
20. An Egg Hunt
21. A Doll Sale

A glance over this list will give one an idea of the possibilities of making use of dramatic expression in teaching. The list of activities is by no means complete; others could be added and the list extended considerably.

Educational Uses of Dramatization. Dramatization should be employed for its value as an activity appropriate for children. It may be used by the teacher as a means to arouse interest in literature and history, as in acting out the parts of famous characters in order to understand an important historical event; but this use of dramatization must always be subordinate to the value of the experience itself. Dramatization is best when employed as a means for obtaining enriched experiences from literature, biography, history, and other school subjects in which the material can be readily adapted

to such practice. In any case, it should be interesting for itself alone; otherwise it becomes an artificial and unreal thing. It is a means of enjoying many things which children cannot have the pleasure of enjoying through direct experience with objects, persons, and events. It may afford opportunity for achieving the useful purpose of making concrete and vivid through bodily expression the more abstract phases of schoolwork.

That it cannot be successfully employed as a device for diagnosing language errors or drilling on language forms is more or less obvious to the observant teacher. The procedure is too general in character and the work spirit is too foreign to the dramatic activity for the latter to be used for such purposes. Diagnosis requires a specific technique of its own. It is, of course, perfectly legitimate to seek to develop through dramatization more adequate use of language and more effective types of expression. Such a purpose, however, is first of all the teacher's purpose. Special emphasis on artificial types of pronunciation, articulation, and gesture is undesirable. Nor is the use of dramatization merely for the opportunities afforded for exercises in enunciation, pronunciation, gesture, etc., a valid procedure. It must be remembered that the most important function of dramatization is to give children experiences in interpreting the thoughts of others through the use of voice and bodily expression, and thus to enable them to understand more adequately and to feel more deeply the great stories of the world as well as to create and act in new stories of their own.

Subjects Appropriate for Dramatic Activities. The subject matter and materials suitable for dramatization purposes are extensive. Literature and history are the most common sources for materials. These subjects may be considered the pioneer sources of materials for this activity, but current events, hygiene, and many other subjects of the content type offer some opportunities for dramatization, particularly in the form of pageants. Stories from history and literature are most readily adapted to stage activities. The practice of adapting a story in nondramatic form to dramatization involves considerable composition, and this is a valuable sort of training for children in English. It also stimulates the imagination of children, encourages inventiveness, and appeals to the creative urge. Many schools are also making much use of original plays by children, and are encouraging them to make their own stage settings and plan their own presentations. The value of such practice can-

not be overestimated, for it furnishes excellent motives for many other meaningful activities such as reading, composition, writing, spelling, pronunciation, articulation, and numerous other activities of a similar character. A glance through the list ¹ of school activities indicated below will give one an idea of the extensiveness of subject matter for dramatization purposes. The reader may readily determine at a glance what school subjects furnish the materials for the various activities. As an exercise, the student may write in the blank at the right of each title the subject or subjects which furnish the material for that particular activity.

TITLES OF ACTIVITIES	SUBJECTS
1. A Mother Goose Party	_____
2. A Visit to the Grocery Store	_____
3. Arabic Life	_____
4. An Indian Entertainment	_____
5. A Celebration of Columbus Day	_____
6. A Health Crusade	_____
7. A Home Garden Fair	_____
8. A Zone Exhibit	_____
9. An Oriental Bazaar	_____
10. An Operetta	_____
11. A Products Contest	_____
12. A Japanese Festival	_____
13. An Arbor Day Pageant	_____
14. A Speakwell Club	_____
15. A Cleanliness Campaign	_____
16. A Better-Speech Crusade	_____
17. A School Service Club	_____
18. Forming a Mercantile Company	_____
19. Furnishing an Apartment	_____
20. A Travel Club	_____

This list contains the titles given to descriptions of projects scattered throughout the *Twentieth Yearbook*, Part I.

Interest in Dramatic Activities. Dramatization needs no extrinsic motivation, for it is a natural form of expression which appeals to children for its own sake. It is not merely a device for creating an interest in things which have no intrinsic value in themselves. The essential thing is that when dramatization is attempted the subject be in itself dramatic and that children have the opportunity to express their ideas in dramatic form. The common use of drama-

¹ See *Twentieth Yearbook* of the National Society for the Study of Education. Part I, pp. 1-178.

tization as a means of teaching a lesson in hygiene, thrift, or some other subject is often bad because neither the teacher nor the pupils feel that the subject is inherently dramatic. Dramatization is first of all an activity. Practice in the collection and organization of information, reading, writing, composition, planning, constructing, etc., may take place as incidental or concomitant learning; but "the play's the thing," in any case.

Dramatization activities give an opportunity for the child to exercise his natural gift for mimicry and his interest in bodily action, to follow his interest in a story, and to give expression to his emotions. He is further pleased by the opportunity to obtain approval of his audience and to outdo his fellow pupils. He is also pleased because of the greater understanding of the meaning of the play which arises from his attempts to interpret it. Incidentally, he gets pleasure from creative activities involved in writing, arranging, building, etc., which accompany the original dramatic activities that are now becoming so common even in the early grades of the elementary school.

Directing the Activity. In the development of dramatic activities the teacher must stimulate, guide, and direct. At least the types of dramatic activities are commonly used in the school: (1) activities adapted from stories or books, (2) those created by children from life, and (3) those which are already composed in dramatic form by others. These different types require, in some respects, similar assignment activities from the teacher. A partial analysis of the assignment activities which characterize these three different types of dramatization is made below for study.

1. Dramatization activities adapted from books
 - a. Selecting the parts of the particular story to be used
 - b. Adapting them for practical classroom purposes
 - c. Learning the parts of the activity as assigned
 - d. Rehearsing the material in preparation for presentation
 - e. Revamping and revising the parts for final learning
 - f. Rehearsing again for final presentation
2. Dramatization activities created from unorganized materials
 - a. Finding the activity to be dramatized
 - b. Developing a plot
 - c. Selecting and organizing materials
 - d. Writing the speeches
 - e. Correcting and revising them
 - f. Learning the parts of the dramatization activity
 - g. Rehearsing them

3. Dramatization activities already written
 - a. Selecting the parts to be learned
 - b. Learning them
 - c. Rehearsing the parts

In addition to these activities, there are a number of others which constitute a part or all of the assignment at times. Among these may be mentioned setting the stage, preparing the scenery, making or obtaining costumes, organizing the details of the show, and other similar tasks. Much of this work is, of course, taken up in the recitation proper and discussed in detail before the assignment is made. How much may advantageously be done in class and how much out of class depends in a large measure upon children's needs and abilities. This matter calls for a great deal of consideration of the aptitudes of each individual member of the class. Some children require assignments to develop and perfect those abilities in which they are deficient, while other children require a different type of assignment to develop additional abilities that they have never attempted to use. In fact, there is no other procedure which offers greater opportunities for differentiated assignments than dramatization.

Class Activities. The very nature of dramatization makes the class period largely a working and planning period. Little can be done in the way of outside preparation except the learning of parts and the collection and organization of materials once the play is actually started. Most commonly, therefore, the classwork consists of planning and organizing, selecting material, composing, constructing, and actually practicing the dialogue and the action of the play.

In creative dramatic activities a large amount of discussion, planning, and organizing is necessary. Pupils and teacher must select the story for dramatization, plan the dialogue and the action, select the characters, and plan the scenes, the stage settings, etc. This type of work is cooperative and requires that children and teacher work together in a group. After this planning is under way individual assignments to certain types of work may be given. One child may be asked to collect pictures from which ideas may be gained for stage settings, another may look up costumes, a third may study other plays to get ideas for action and dialogue. All sorts of things may be undertaken by individual children at the suggestion of the teacher.

Often classwork will consist of the cooperative writing of the

dialogue of the play with the teacher giving suggestions and helping individual students with their work. Rewriting and revision of parts may constitute the work for the day. Then, finally, comes the actual rehearsal. Pupils and teacher work together on the problems of expression inherent in the activity, and carry the work forward to completion.

Less pretentious dramatic activities, which consist of merely reproducing a play already written by someone else, may require, of course, far less time and far less work in and out of class. A play may be read by the class and acted out in an informal way within the confines of an ordinary class period. In such a case no home assignment is either necessary or desirable. Such little plays have for a long time been common in the school and have their value as preparation for original play-making by the children themselves. They also offer opportunities for the teacher to train the pupils in better forms of expression and to improve their voices, gestures, and action. Many a recitation may well be taken up with the reproduction of a simple play.

Pantomimes, pageants, and other forms of dramatic activities offer, as do original plays, a large opportunity for cooperative purposing, planning, organizing, and constructing. The selection of material, the planning of the sequence of scenes, the making of costumes, etc., give children an opportunity for creative activity which they so much enjoy. The teacher's task is to guide and direct and to get as much in the way of original work from children as possible; for the great value of this type of activity is in the amount of thinking and planning that children have to do in carrying it to completion. Pantomimes and pageants appeal particularly to children, too, because of their inherent simplicity and the opportunities offered by them for original thinking and planning.

Activities Involved in a School Pageant. An example will illustrate in a concrete manner the nature of the activities engaged in by children when working out a school pageant.²

A PAGEANT OF SPRING

Step I. Class discussion of all types of entertainments that might prove satisfactory. All agreed finally upon a pageant having a "Spring motif."

² Reported by Clara A. Dobbin to the committee on the preparation of new materials of instruction of the National Society for the Study of Education, *Twentieth Yearbook*, Part I, pp. 125-27.

Step II. Children and teacher brought in for examination and criticism many plays, pageants, and books dealing with festivals and festival making. Among them was "A Flower Wedding." "Flower Wedding" was chosen for their play.

Step III. Discussion of plots based upon stories and plays read. A plot was adopted. A little girl is overcome with sleep in the garden, and dreams she overhears the gossip among the wall flowers concerning a wedding they have just witnessed.

Step IV. Class discussion of flowers and shrubs that could be used as characters. This involved a trip to the woods and the identification of many common wild flowers. The following were selected:

Time: Four-O'Clock; *Place,* Steeple Bush Church; *bells,* Blue Bells; *Minister,* Jack-in-the-Pulpit; *License Clerk,* Solomon's Seal.

The wedding: *Bride,* Lily; *Groom,* Sweet William; *Train Bearer,* Baby Blue Eyes; *Matron of Honor,* Orchid; *Bride's Maids,* Pinks; *Mother,* Lavender.

Guests: Miss Daisy, Miss Phlox, Miss Ragged Robins, Miss Maréchal Niel, Miss Rose La France, Miss Blue-Eyed Mary, Master Johnny Jump-Up, Miss Violet, Miss Black-Eyed Susan, and Master Bleeding Heart.

Refreshments: Partridge (Berry); *Flavors,* Mint and Sage; *Butter-and-Eggs;* Sweet Peas, Snowballs, Cherry Wine; *Waitress,* Bouncing Bet.

Gifts: Lady Slippers, Pitcher (Plant), Butter Cups, Arrowheads, Flags.

Step V. Class divided into committees, each responsible for the following items:

- a. *Staging.* Worked out in the manual training department; involved preparing drawings to scale to report to class before actual construction could begin. Many changes were worked out in original plans after such discussions.
- b. *Composing the dialogue* for the various characters. Many lessons in English were involved. Competitive prize was offered for the best verses submitted for use in the play. Several good ones were accepted.
- c. *Costuming the characters.* Involved study of the flowers, making drawings to show design and coloring to the class before actual work on the material was undertaken. Many of the parents came to school daily to aid the girls in their actual work of seaming, stitching, and the like.
- d. *Songs to be used in the play.* Many were presented; class made selections. These were taught under the direction of the instructor of music.
- e. *Program-making.* Folders bearing original or copied designs were submitted for class criticism. This led to adoption of some, rejection of others. Every child in the school wrote two (no printing presses were available), and these were tied in the folder for distribution to the patrons.
- f. *Booklet* made by those children having cameras. These children took pictures of the stage, of the characters and of some striking scenes, arranged them in an attractive manner, and presented the booklet to the school.

The above example illustrates well a kind of creative work which finds an outlet in dramatization. The opportunities for individual assignments and group activities, both in and out of the recitation, are abundant.

Measuring Results. The success of a dramatization is determined by the reaction of the listeners. What counts is the effect which a play, pantomime, pageant, or other similar activity has upon the audience. This effect is measured by the amount of applause or by the call for a second rendition of a play. The teacher may judge the success of dramatization by the extent to which it has initiated other activities or has suggested leads to further study. Testing in the usual sense of the word is then not necessary. Since dramatization is engaged in primarily for its own sake, there is little or no value to be obtained by using a measuring instrument in the form of a written test. However, a check list, such as the following, may be used advantageously by the student to measure how well he is succeeding in mastering his part of the dramatization activity.

A STUDENT'S CHECK LIST FOR JUDGING THE PREPARATION OF A
DRAMATIZATION ACTIVITY

Directions: Encircle "YES" if you observed any of the following conditions in the preparation of a dramatization activity; "NO" if you did not observe them.

- | | | |
|---|-----|----|
| 1. Did the dramatization activity originate out of class discussions? | YES | NO |
| 2. Was it adapted from a story or a book? | YES | NO |
| 3. Was it a creative product of the class? | YES | NO |
| 4. Did it fulfill a personal need? | YES | NO |
| 5. Were you a partner in selecting the dramatization activity? | YES | NO |
| 6. Were you enthusiastic about it? | YES | NO |
| 7. Did you help to compose the different parts of the dramatization activity? | YES | NO |
| 8. Did you write any of the speeches? | YES | NO |
| 9. Was friendly class criticism given in composing and revising the different speeches? | YES | NO |
| 10. Were class discussions helpful in revamping speeches? | YES | NO |
| 11. Did the teacher select the different characters? | YES | NO |
| 12. Did all members of the class have an opportunity to participate? | YES | NO |
| 13. Did you have a leading part? | YES | NO |
| 14. Were you assigned your part of the dramatization activity by the teacher? | YES | NO |
| 15. Were the characters well adapted to their parts? | YES | NO |
| 16. Were you disappointed with your part? | YES | NO |

17. Were helpful suggestions made in learning your part?	YES	NO
18. Did you have to rewrite yours?	YES	NO
19. Was your part of the dramatization activity easy to learn?	YES	NO
20. Did it take several days to learn your part?	YES	NO
21. Did you learn your speech by mere repetition?	YES	NO
22. Did you recite it orally to yourself or to someone else before taking part in the rehearsals?	YES	NO
23. Did you participate regularly in rehearsals?	YES	NO
24. Were the rehearsals helpful in learning your part?	YES	NO
25. Were you interested in doing your part well?	YES	NO
26. Did the characters seem to be well pleased with their parts?	YES	NO
27. Did some of the characters act out their parts better than others?	YES	NO
28. Would you like to participate in another similar activity?	YES	NO
29. Did you think the audience enjoyed your efforts to present an interesting dramatization activity?	YES	NO
30. Did you learn many other things besides acting?	YES	NO

Outcomes. As was stated in the preceding section, dramatization has two important functions to perform: (1) that of developing expression and (2) that of providing entertainment. It is sometimes used to check on children's oral language habits, but if employed for this purpose, it should be regarded as an incidental activity, for this is not the main purpose of dramatization. Dramatization is too general in nature to be an effective diagnostic instrument. There are other procedures which can be employed more effectively for such a purpose. Dramatization is a valuable means of developing appreciation. It also furnishes a release for the emotions. These are more or less the natural accompaniment of motor and intellectual activities engaged in by children in dramatizing an event full of action. As a classroom procedure, dramatization should aim to serve the useful purpose of furnishing an opportunity for expression. In initiating leads to many other activities, it provides for a wide range of interests among children. They have their wants richly satisfied. No other motivation is necessary when dramatization is carefully and earnestly employed. Dramatization affords an abundance of opportunities for bodily expression in which children's instinctive tendency to action finds a desirable and enjoyable outlet.

STUDY QUESTIONS

1. Why is dramatization especially well adapted to the use of children?
2. What other types of learning than motor expression are usually involved in dramatization?

3. What are the characteristic features of the following forms of dramatization?
 - a. Pantomimes
 - b. Plays
 - c. Pageants
 - d. School Fairs
 - e. Operettas
 - f. Carnivals
 - g. Bazaars
 - h. Celebrations
 - i. Crusades
 - j. Campaigns
4. How may dramatization activities serve as leads to other activities?
5. What may be the objection to using dramatization for diagnostic and remedial purposes?
6. What are two important functions of dramatization?
7. What stories or materials may children organize into dramatization activities?
8. What are the steps involved in composing a play or pantomime from the subject "keeping the body healthy"?
9. What are several sources of materials for dramatization purposes?
10. How may dramatization be employed to motivate school work?
11. How may differentiated assignments be provided for in dramatization?
12. What is the most useful type of dramatization?
13. What are several distinctions to be observed between classwork and individual work in dramatization?
14. What activities may be most satisfactorily engaged in during the recitation?
15. What is the value of a student's check list in preparing the dramatization?
16. How is success in dramatization to be measured?

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Contains related exercises.

In Chapter XV, the socialized classroom was discussed from the standpoint of the teacher's activities in directing group participation. In the present chapter, reporting and recitation are presented from the point of view of the functions of these activities in a modern school.

Reporting is not a new school activity but in recent years it has become increasingly common, and in many places it has replaced the older recitation in which the child merely repeated what he had learned from the textbook. In making a report the pupil attempts to contribute new knowledge to his class group rather than merely to tell them what they already know. To prepare a report requires that the pupil effectively read, organize, plan, and deliver the information which he has gained from investigation and study. Such a report is followed by socialized discussion rather than by a test, either oral or written, as was the custom for so many years. A written test may tell much more readily whether or not pupils have "studied their lesson" than a prolonged oral recitation. Mere recitation tends, too, to memorization of half-understood words rather than to real understanding. Nevertheless, it would be erroneous to say that recitation does not at times have its uses. Both types of activity will be discussed in this chapter in such manner as to show how classwork may be improved by pupil activity of the participative type.

Definitions of Terms. A report is a connected discussion of a topic generally more or less extended in character. A recitation is technically a reproduction of the ideas presented in a textbook or ref-

erence book or both. There may seem at first little difference; for to a child a report may be merely a rather faithful recitation of what he has read in some supplementary or reference book. That depends on the assignment made for the report. Generally a report includes data from several references; a recitation may be thought of as including the material from a textbook. The report implies an original organization of material; the recitation implies faithful reproduction of what has been read or studied. This is the traditional meaning of the latter, although it may be properly modified to include reporting and other forms of more original expression. A report, therefore, requires greater originality, more extensive reading, planning, and organizing, and a freer use of original expression than the recitation as such. It is more in keeping with the idea that learning should be active and creative than the typical recitation of the past. For all practical purposes, however, the report might be regarded as a new form of recitation. The function of the older recitation was largely that of assuring the teacher that the pupil had learned the lesson. It was a period for testing rather than a period of socialized discussion and thinking. The changed form of the recitation includes reporting, discussion, planning, organizing, constructing, working, testing, and other activities.

Principles for Preparing a Report. A list of guiding principles¹ for the preparation of a report reveals the creative nature of such an activity in the modern school:

1. In order to make a good report you should make a careful outline.
2. Decide on how you are going to open your report and set down a few suggestive sentences. Call this the "introduction."
3. Now decide on the body of your report. In your mind, arrange the points you wish to emphasize in order of their importance, leaving the most important point to the last. Make an outline for the body of your report from these materials, listing under each main point the main facts found in each reference and the illustrations that you want to use.
4. Decide now upon how you will end your report and outline briefly the ending, which is generally made up of the conclusions you have drawn from your materials.
5. When you have written your report, read it over several times to fix the main ideas in mind and to see whether or not you have said what you want to say.

It is obvious that such a list of principles implies that the report is far different from the traditional recitation, with its repetition

¹ Yoakam, G. A., *Reading and Study*. New York: Macmillan Co., 1928. P. 156.

of the textual material with little thought and often with great fidelity to the language of the text. Modern recitation requires a far freer and more original type of response than was commonly present in the traditional use of this activity.

Reports and Reporting. Reporting has to do primarily with the gathering and imparting of information. The report is factual. Dramatization, storytelling, and conversation deal more generally with the recreational aspects of the recitation; reporting with the work aspects. Reporting is appropriate when accurate information necessary to the solution of a problem or the better understanding of a subject is essential. But reporting is more than that; it is a form of activity calculated to develop originality, initiative, and improved expression among pupils. Its function is then twofold: (1) to serve as a means of collecting and disseminating information otherwise unlikely to be known; and (2) to train the reporter in the gathering and dissemination of information. In modern schools, reports and discussions by pupils now take the place of the question-and-answer type of recitation.

From the children's point of view, the object of a report may be to inform, to entertain, or to convince and persuade others; or he may use the report to improve the organization of his material, or to improve his ability to think effectively on his feet. The latter function of the report is more appropriate for children of the upper grades; but even very young children may be encouraged to understand the value of reporting facts and experiences in a coherent manner to other children of the class.

Where and What to Report. In a classroom organized on the unit of work procedure, occasions for reporting are the natural result of the cooperative study of a unit of either the subject or experience type. Children on the lower levels may report on the events of a game, a trip, or an accident with a greater degree of fluency and ease than they can describe or explain in a logical order the appearance of a certain kind of automobile; but reports of a factual nature should not be neglected even among very small children. Vital topics for reports may be found especially in the social studies area, but any other field may also offer rich opportunities for this type of democratic, cooperative activity.

Cooperative Work Motivates Activity. A requisite condition for motivating reporting is to organize the class into comparatively small groups to study different phases of a common topic. The sev-

eral groups within the class compete with one another in trying to give the most effective and interesting report. These groups should work freely and informally together. The feeling that they are working cooperatively on a significant topic is a powerful incentive to learn.

The intrinsic value of a problem itself is an essential motivating factor in this activity. The material should be interesting and valuable to the learner. Real problems and topics should be selected for this purpose rather than unreal and imaginary ones. The fact that the pupil is to use the ideas he is collecting to inform to persuade, or to amuse others also gives a genuine motive for activity and a feeling that it is significant.

One of the very best means of insuring continued pleasure in reporting is success in making a creditable report. Success is made possible when the teacher assists pupils in finding interesting subjects and trains them in the art of making meaningful reports on these subjects.

Planning the Report. One of the first questions which arises in connection with the assignment of the report is, How shall the work be directed? Generally, the teacher and the pupils together should decide on the nature and the extent of the report to be made. Pupils enjoy this sort of partnership in choosing their problems. In most instances, they should then be permitted to choose the subject on which they wish to report. This practice tends to create increased enthusiasm among them when they are seeking and collecting information for their reports. It is certainly much more desirable to enlist the cooperation of pupils in making plans for reporting than merely to issue commands. The pupils will undertake a report more readily and persist in finding and organizing data when they feel that it is a voluntary type of activity.

Directing the Child's Preparation. As in making assignments for other types of classroom activities, it is necessary to observe certain guiding principles in assigning reports. Among other things, pupils must know exactly what is to be done and how it is to be done. Otherwise they will have a great deal of difficulty in knowing what is to be emphasized in their reports. Guidance of this sort will call for specific directions dealing with the various phases of each topic, as well as with the particular procedure to be employed in making the report. In fact, all the principles of guidance in making other kinds of assignments are applicable here.

A Summary of Suggestions. A few specific directions which will serve as guiding principles are:

1. Select or cause to be selected a subject or topic which is important. One which permits of extensive investigation is desirable.
2. Have the different phases of the subject so organized as to suggest an urgent need or purpose.
3. Make certain that the topic is within children's experiences.
4. Investigate beforehand the amount of reference materials available and see that they are easily accessible to children.
5. Indicate some of the important phases of the subject or topic to be investigated by the different pupils.
6. Suggest special references for gathering data on these important phases of topics.
7. Stimulate interest in searching for information about topics by making a few introductory remarks, or by relating incidents about some significant phase of the subject, or by using some other means in keeping with good practice.

Recitation Activities in Reporting. The reporting of data calls for a socialized setting. A plan for organizing the class for this purpose is found in the Decroly Plan.² It is quite probable that this plan, modified in some respects, could be satisfactorily employed with pupils in all grades of the school. A brief résumé of it is given here for observation and study.

1. The class is segregated into small groups of fifteen pupils each.
2. A common problem is selected for investigation and study.
3. Each pupil selects some phase of a subject or topic which especially interests him.
4. He investigates it by reading, observation, and study.
5. He writes out a full report, giving illustrations and specimens to supplement it.
6. He spends several days—about a week—in preparing his report.
7. When his report is prepared, he presents it to the other members of the class in the form of a lecture.
8. He uses the blackboard, passes out specimens or examples among other children assembled about the tables, and answers questions which are asked.
9. His fellow classmates besiege him with questions both from an interest in the subject and from a desire to find out how well the lecturer knows it.
10. If he is found deficient in important information, the class may require him either to look up the information he lacks, or even re-do the entire report.

² Washburne, C. W., and Stearns, Myron M., *New Schools in the Old World*. New York: John Day Co., 1926. Pp. 66-82.

11. The other pupils listen and take notes during the lecture or write them up afterwards.
12. The writing up of reports of others, and the preparation and correction of their own reports, occupy the greater part of the pupils' school day.

This method embraces many of the important characteristics of the child-centered and the social-centered school. It provides for individual instruction, project work, socialized group work, and for many other learning activities which characterize modern progressive educational methods. But a careful review of the original Decroly method will disclose a number of weaknesses which must be carefully considered by the teacher before adopting it. These are not indicated here, but the reader may familiarize himself with them by reading the reference previously cited.

Measuring Results. If it is found necessary to measure the success of oral reporting, the teacher may develop a list of criteria and judge the report accordingly; or he may personally observe the reaction of the listeners and judge the effectiveness of the report in this way. Written reports can be measured, like other written work, by the teacher's judgment. The effectiveness of an oral report is best revealed by the reaction of the listeners. Pupils may be asked to give general evaluations of reports to which they listen. It is also possible to have pupils rate one another's reports on some definite objective scale or check list. This practice tends to improve reports by making pupils more conscious of their desirable characteristics. A suggestive check list to be used by pupils in evaluating one another's reports is given below.

A STUDENT'S CHECK LIST FOR JUDGING AN ORAL REPORT

Directions. Draw a circle around "YES" if you believe the reporter was effective on a certain point; draw a circle around "NO" if you believe he was not.

- | | | |
|--|-----|----|
| 1. Did the pupil reporting seem to be aware of what his subject was about? | YES | NO |
| 2. Did he show evidence that he had investigated the subject thoroughly? | YES | NO |
| 3. Did he show an interest in his report? | YES | NO |
| 4. Did he keep to his subject or topic? | YES | NO |
| 5. Did he make what he said clear? | YES | NO |
| 6. Did he use illustrative materials or examples? | YES | NO |
| 7. Did he emphasize any important points? | YES | NO |
| 8. Did he lose much time in fumbling with his subject? | YES | NO |

- | | | |
|---|-----|----|
| 9. Did he make any wrong statements about his subject? | YES | NO |
| 10. Did he make any mistakes in language? | YES | NO |
| 11. Did his report confuse you about some things? | YES | NO |
| 12. Did he answer correctly questions which were asked about some phase of his report? | YES | NO |
| 13. Did he show evidence that he had memorized his report? | YES | NO |
| 14. Did he finish any part of his report? | YES | NO |
| 15. Did you think he enjoyed giving his report? | YES | NO |
| 16. Did you enjoy it? | YES | NO |
| 17. Did he convince you about any point in his report? | YES | NO |
| 18. Did he have enough time in which to give his report? | YES | NO |
| 19. Did he appear to be glad to get through with his subject? | YES | NO |
| 20. Did he summarize any part or all of his report? | YES | NO |
| 21. Did you think he should be required to make further study on any particular phase of his topic? | YES | NO |
| 22. Did you think he should re-do the entire report? | YES | NO |

Educational Outcomes. The extent to which pupils have enriched their regular classwork by supplementary readings can be quite effectively revealed by preparing a report on these activities. Wide reading is very necessary in order to give fullness to reports. This habit is a good one to encourage, for the informational value of the report will depend largely upon how much collateral reading was necessary in its preparation. Fullness of the ideas contained in the report will depend, in no small measure, upon extensive reading. One writer ³ suggests that certain knowledge is essential to the preparation of a written report. He says:

If a report is to be written, does the child have simple knowledges about correct and incorrect forms of language, punctuation, capitalization, and paragraphing? Does he know how to write a paper from an outline? Absence of these knowledges may be at the base of the failure to appear well before his classmates and may be the basic cause for his lack of interest in activities which have to do with discussion following study.

STUDY QUESTIONS

1. How is reporting related to research work?
2. For what purposes may reports be used, other than to inform others?
3. What are examples of topics or subjects suitable for reports designed to entertain? For reports designed to persuade?
4. What is the value of an outline in preparing a report?
5. What kinds of subjects are the most interesting ones to report on?
6. Why is it best to work out the assignment for the report with the pupil concerned in preparing and giving it?

³ Yoakam, G. A., *Reading and Study*. New York: Macmillan Co., 1928. P. 156.

7. What are the main features of the Decroly Plan of reporting information?
8. Why is it difficult to predict the success of any organized class procedure?
9. How may the success of oral and written reports be measured?
10. What knowledge must the pupil have before attempting to prepare a written report?

SELECTED REFERENCES

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Gives a brief discussion of the characteristics of the report.
2. HARRIS, FRED E. "Do Children Think Critically about Classroom Procedures," *Journal of Educational Psychology*, Vol. 39 (1948), pp. 52-9.
This is not a discussion of reports and reporting but it expresses children's reactions to various kinds of class activities, including reporting.
3. REAGAN, G. W. *Fundamentals of Teaching*. Chicago: Scott, Foresman and Company, 1932. Pp. 280-300.
Gives steps in directing the preparation and presentation of reports. This is a good elaboration of the subject.
4. RATHS, LOUIS. "Improving Classroom Instruction," *Educational Research Bulletin*, Vol. 24 (1945), pp. 6-13, Ohio State University, Columbus, Ohio.
Contains a very good treatment of class discussions and what they should accomplish.
5. YOAKAM, G. A. *Reading and Study*. New York: Macmillan Co., 1928. Pp. 155-57.
Suggests a procedure for making oral and written reports.
6. YOAKAM, G. A., AND SIMPSON, R. G. *Directed Study and Observation of Teaching*. New York: Macmillan Co., 1934. (Revision in preparation.)
Contains related exercises.

Just as the child learns through observation of people, things, and events in the real world; through using his body and manipulating things; through memorizing and associating facts and ideas; through experimenting, creating, and problem-solving in direct contact with life and events; so he learns vicariously through the indirect medium of the printed page. No study of teaching and learning can be complete which ignores this common aspect of education. Schools are and have been since the middle ages places where children are expected to learn to practice the art of reading.

Reading Advances Civilization. By means of the printed characters which we call letters and figures, a writer may communicate his ideas to anyone who can read. His thoughts are transferred to paper. Records are made of past events. Through the art of reading, these thoughts and records may be communicated to anyone who has learned to read. Because of the existence of the art of writing and reading, vast strides have been made in civilizing the world. The practice of recording the results of experience and handing it down in written form from one generation to the next has made possible the rapid spread of knowledge and its accumulation from generation to generation.

A Complex Skill. Psychologically and physiologically, the act of reading is one of the most interesting accomplishments man has made. To read the printed page is a skill which involves all the higher mental processes—association, judgment, and reasoning. Silent reading is that aspect of reading in which the reader is chiefly concerned with the interpretation of the record made by

the printed page. Oral reading is the art of sounding the words which are represented by the characters on the printed page and interpreting the meaning to another by the use of tone, phrasing, emphasis, and gesture. The process by which he interprets the meaning of printed words parallels the mental processes of the reader in other uses of language. Reading as a psychological process may be fairly simple or extremely complex, depending upon the type of material which is read and the age and maturity of the reader. It is also to be noted that reading the printed page involves emotional reactions of approval, disagreement, sorrow, joy—in fact the whole gamut of human experience may be run vicariously through the medium of the printed page.

The Use of the Eye in Reading. Physiologically, reading is a fascinating study because it makes constant use of the eye, a mechanism which has provoked lovers to joy through its beauty and scientists to admiration through its construction and use. The most marked phenomena of the eye in reading have been studied by psychologists through the use of photographic apparatus. It has been learned that the eye should move regularly and rhythmically along the printed line if reading is to be effective. The eye perceives the printed words during a series of pauses or fixations and may take in a word, a phrase, or even a short sentence during a single pause. It seems that the eye is a mechanism which adapts itself, under the best circumstances, to reading wholes rather than parts and enables the reader to recognize whole words and groups of words as economically as possible. Recent knowledge concerning the use of the eye in reading tends to support the growing belief that the emphasis upon thoughtful interpretation, rapid, effective reading, and the perfection of silent thought-getting are fundamentally sound ideas physiologically as well as psychologically.

Eye Movements in Reading. Faulty eye movements are symptoms and not causes of poor reading habits. They may furnish the primary teacher with the clue to reading difficulties. For that reason he should be familiar with the analysis of eye movements in reading as revealed by a photographic apparatus known as the ophthalmograph. In reading, the eye moves from left to right along the printed line in saccadic or discontinuous movements. In so doing, they may make regressive movements. That is, the eyes may turn back to review a word or phrase in order to properly identify it. Poor readers make more regressive movements than good readers. A good

silent reader at the high school and college level will not make more than five or six eye fixations per line in reading ordinary prose, whereas a poor silent reader of the same level of maturity and education will make many more fixations per line. The following tables which contain material adapted from Buswell's study¹ show the median number of eye fixations and regressions per line in silent readings:

TABLE 9. The Median Number of Eye Fixations per Line in Reading

GRADE	EYE FIXATIONS	
	ORAL	SILENT
	READING	READING
1 B	16.0	18.6
1 A	14.5	15.5
2	12.0	10.7
3	10.4	8.9
4	10.3	7.3
5	8.7	6.9
6	8.9	7.3
7	8.7	6.8
College	8.4	5.9

TABLE 10. The Median Number of Regressive Movements of the Eyes per Line in Silent Reading

GRADE	MEDIAN NUMBER
	REGRESSIVE MOVEMENTS
1 B	5.1
1 A	4.0
2	2.3
3	1.8
4	1.4
5	1.3
6	1.6
College	0.5

In order to express pictorially how the eyes move in silent reading, two sections of two separate reading graphs are given in replica in the following illustration.

The section of the graph at the left in Figure 10 shows the nature of the eye movements of a reader before practice. The one at the right shows the nature of the eye movements for the same student after practice in reading under controlled conditions.

¹ Adapted from Buswell, G. T., *Fundamental Reading Habits: A Study of Their Development*, Supplementary Educational Monographs, No. 21, Department of Education, University of Chicago, 1922, by permission of the author.

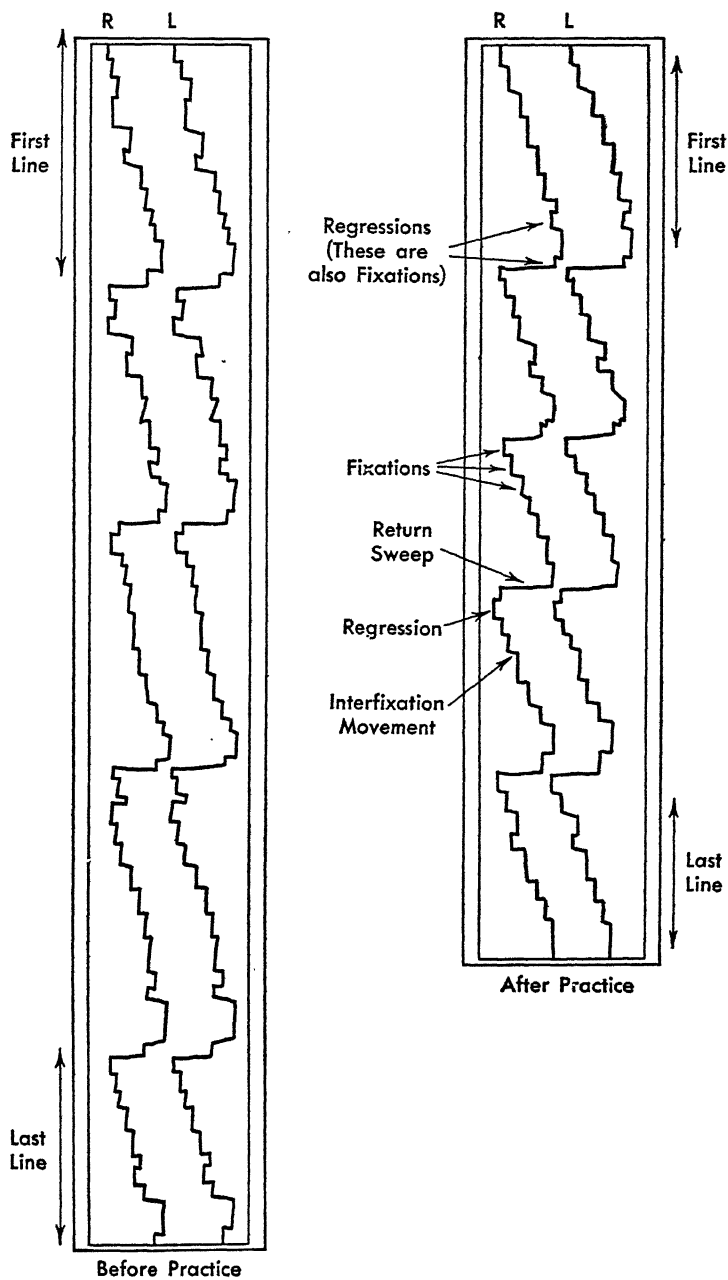


Figure 10. Two reading graphs for the same student before and after practice.

The zigzag line at the left in the graph is a record of the right-eye movement. The zigzag line at the right is a record of the left-eye movement. The short parallel vertical lines represent eye fixations, some of which are regressions and are shown in the graphs by their slight extension to the left of the other fixation points. The longest horizontal lines represent return sweeps of the eyes. These occur when the eyes complete one line and return to the beginning of another.

In the primary grades, chart-building exercises and chart reading afford the best opportunities for practice in getting the left-to-right movements of the eyes along the printed line. Certain well-made flash phrases are also helpful in getting children to sense the left-to-right movement of the eyes as well as to recognize large units of reading material. The flashmeter, which is a mechanical device now employed in some schools to flash words and phrases, and the metronoscope are useful in developing rapid perception and the rhythmic movements of the eyes in reading. These devices are much more satisfactory for developing the left-to-right movements of the eyes than some ready-made paper-and-pencil exercises which have been prepared for the same purpose and advocated by recently published reading manuals.

Vision and Maturation. Recent research ² reveals that many children are not physiologically mature enough for the strain required of their eyes in beginning reading. It is extremely doubtful that they can keep pace set by older children in reading first-grade material on account of their immature vision. Since there is positive relationship between reading deficiencies and eye development, some consideration should be given to children's visual maturation.

All children at birth and for sometime thereafter are normally farsighted. Experimental research shows that from 45 to 80 per cent of six-year olds have hyperopia. But as this condition gradually corrects itself as the eyes mature, there is no need of apprehension. Usually by the age of nine years, only 18 to 20 per cent of the children remain farsighted.³

Reading small targets at the usual book distance from the eyes

² Betts, E. A., "Physiological Approach to the Analysis of Reading Disabilities," *Educational Research Bulletin*, Ohio State University, Vol. 13 (Sept. and Oct., 1934), pp. 135-40 and 163-74.

³ According to the Helmholtz theory farsightedness is due to an elongated eyeball. Lately, however, there is evidence that this condition may be due to the habit of reading for comfort.

requires the two eyes to be coordinated. That is, they must fuse the vision so that the two eyes see as one. It is quite generally believed by those who are in position to know that the full development of comfortable two-eyed vision is not reached by most normal children until the fifth or sixth year. Betts⁴ believes that at least 25 per cent of the children mature at a later age than this.

In a study of 194 first-grade children, Betts⁵ reveals that 38 per cent were farsighted, 14 per cent lacked normal fusion, 38 per cent had faulty eye coordination, and 10 per cent had eye-muscle imbalance. All of these difficulties of course tend to become less pronounced with increased age. It is probable that some children develop undesirable mechanical reading habits by being required to read typical first-grade material at six years of age.

Mechanics of Reading Materials. Hygienic conditions require reading materials to be so constructed as to reduce eye strain to a minimum and thereby eliminate much of the optic fatigue which frequently accompanies reading under strain.

The size of type has not been conclusively determined by research. But the evidence is in favor of using large type for printing the materials to be read by younger children. This tends to reduce fatigue and increase the legibility. Some children at six years of age are visually too immature to read materials printed in 16- and 18-point type. Recent studies support this point of view. All sight-saving materials are printed in 24- and 32-point type. Why not use the same size type for printing reading material for the primary grades? Obviously children can read material which is printed in much smaller type, but they will read it more slowly and with much greater optic fatigue than material which is printed in sight-saving type.

The length of the line that is best for the primary grades is dependent more upon the size of type than any other factor, although it has not been shown by research that the length of line is an important consideration in preparing reading material for primary-school children. It probably does not make much difference what the length of line is when the size of type is kept constant. Habit appears to have something to do with the rate at which children read for any given length of line.

⁴ Betts, E. A., *The Prevention and Correction of Reading Difficulties*. Evanston, Ill. Row, Peterson & Co., 1936. Pp. 66-8.

⁵ Betts, E. A., "Is Reading Related to Growing Up?" *Progressive Education*, Vol. 11 (1934), pp. 450-53.

Suitable paper permits little glare and a large measure of legibility. Paper which is dull in finish is used by sight-saving classes and is recommended for use in the primary school.

Adequate lighting requires from ten to twenty foot-candles⁶ for ordinary reading tasks of approximately fourteen inches from the eyes. Such lighting tends to reduce the amount of neuromuscular tension to a minimum. Reading material printed in large type requires less intensity of light—about six foot-candles—and material printed in medium-size type requires about thirteen foot-candles. Daylight under control gives the best results for the eyes in reading and is the best guide for artificial lighting with regard to intensity, composition, and distribution.

Other Physiological Aspects of Reading. To the physiological psychologists, the mechanism whereby the reader is able to recognize words and to associate them with their meanings is an interesting study. The teacher should understand something of the physiology of reading, but the whole story of it is too long to tell here. The reader is advised to consult a good book on the psychology of reading for a detailed explanation. It is sufficient to point out that the process of reading involves the neuromuscular system of the head and chest, with particular emphasis in the early stages upon the vocal apparatus, and that the processes of association, judgment, and reasoning involve the brain mechanism in its most complicated areas. What is seldom pointed out, however, is the fact that the whole sympathetic nervous system is also involved in reading. Subliminal nervous, muscular, and glandular reactions are probably much more affective than the ordinary reader realizes. It is probably not an exaggeration to say that the reader reads with his whole body rather than with his mind alone. Reading is an act that may cause much muscular, nervous, and emotional fatigue and is fraught with possibilities of evil as well as good. The act of reading requires also that the reader remain more or less physically quiescent for long periods of time. The effect of too much application to the printed page by children often appears in lack-luster eyes and pale cheeks.

The Power of the Printed Page. The tremendous power of the printed page to affect ideas, emotions, and overt behavior is so

⁶ Foot-candles refer to the intensity or brightness of light and are measured by means of a so-called "light meter." Such a device is commonly used by amateur photographers, who term it an "exposure meter."

great that the act of reading is rightly regarded as a potent source for good or evil. The influence of bad books on human life may be incalculable, while the equally potent forces of great books in influencing human ideas and conduct is so great that the individual who reads is constantly bombarded by myriads of words exhorting him to noble ideals and faultless behavior. The nature of reading causes it to be an act of great social, political, moral, and economic importance in the world.

Purpose of the Teacher in Reading Instruction. The only really effective reading is purposeful reading. When we think of reading in the school, however, we must think of purpose from two viewpoints: (1) the viewpoint of the teacher and (2) the viewpoint of the child. The purpose of the teacher of reading in the early grades of the school is usually to train the child in the art of recognizing and interpreting the words and sentences of the printed page. Later he comes to have as well the purpose of teaching the child to enrich his experience and to gain increased knowledge about life through the practice of reading. Someone has said that the child first *learns to read* and then *reads to learn*. Teachers have often spent entirely too much time developing the mechanical aspects of reading and not enough developing the habit of thoughtful reading for the many purposes which reading may serve. In this chapter, the use of reading as a tool of learning is emphasized mainly. We shall, therefore, devote little attention to the problem of teaching the child to learn the mechanics of reading.

Readiness to Read. The readiness of children to read is now being regarded by progressive teachers as a requisite to success in subsequent schoolwork. The results of recent research in the development and growth of children and the careful observation of their behavior reveal certain indisputable facts relative to the lack of maturity and readiness to begin reading upon entering the first grade. Among these facts may be stated the excessive amount of reading retardation which is due to a multiplicity of causes. One rather astounding fact is that from 20 to 25 per cent of first-grade children fail because they are too immature to understand the material which they are required to read. In one school almost all children spend two years in the first grade. In another school 70 per cent of the third-grade children repeat one or more semesters because they fail in reading. Some teachers believe that many first-grade children are not only too immature but also too inexperi-

enced and unprepared to participate in formal first-grade programs.

The results of wide-scale objective testing indicate that in the first grade the most capable child has approximately three times as much potential power as the least capable. Furthermore, research data reveal that children less than six years and three months or six years and six months do not succeed as well as older children in a typical first-grade program.

A report⁷ on pupils' readiness for reading instruction when they enter the first grade shows that 90 per cent of the teachers who were solicited in the survey voted in favor of delaying reading for several months.

The evidence strongly supports the fact that children less than six years of age, unless above average in intelligence, tend to fail. One investigator⁸ who made a study of the problem reports that children entering the first grade under six years of age, unless they possess an I.Q. of 110 or better, have little chance of success in the first and subsequent grades.

As a result of the findings of recent research, many school officials are becoming more convinced than ever that children should have a mental age of six years and four months or over as a basic requirement for entrance to the first grade.

There are many instances in which children under six years of age and of average ability have been taught to read with fair success. But the question that naturally arises is, Do they have to begin as early as that when their development is promoted by a well-rounded activity program?

Obviously teachers can not wait until children show a desire to read. The desire must be created so that when they reach the proper maturity they will not only want to read but will be able to read as well. It may be proper to say that children should be exposed to reading at least by the age of seven or eight years. Otherwise other interests may offer formidable competition with their reading interests, and therefore make subsequent learning difficult. Children need not be consulted when they wish to begin reading. The teacher must be the judge of this qualification. However, his judgment on the matter must be supported by the results

⁷ United States Bureau of Education, "Pupils' Readiness for Reading Instruction upon Entrance to the First Grade," *City School Leaflet*, No. 13 (1926), Washington, D. C.

⁸ Bigelow, E. B., "School Progress of Under-Age Children," *Elementary School Journal*, Vol. 35 (1934), pp. 186-92.

of a wide variety of tests and other data. Some of these tests include tests of intelligence, perception, motor coordination, visual functions, and many other tests of an informal nature.

Evidence of Reading Readiness. Signs of children's readiness to begin reading may be observed in their interests in books, stories, words, numbers, writing, their ability to learn rhymes, tell experiences, and listen to and comment on anecdotes and stories read to them. Among the other symptoms of desired development are attention, interest, industry, maturity, and use of the language in class activities.

Before systematic instruction in reading is begun, considerable data about children should be made available. A survey by means of observation, questionnaire, and interview is a prerequisite to the more objective approach to formal instruction. The data obtained from the survey should then be supplemented by the results of readiness tests, including tests of intelligence. At no time should test scores be used alone to determine reading readiness. Certain physical functions must also be considered. Data on vision, condition of children's adenoids, tonsils, teeth, etc., should be collected. In fact, the results of a complete physical examination of every child should be available for study when the reading-readiness program is being organized.

Why the Child Reads. From the child's point of view, reading is done for several different major reasons. First, the child may read because the teacher or his parents want him to read. Second, he may read because he enjoys reading for the recreation it affords. Third, he may read because reading will furnish him with useful information of either remote or immediate value. Both recreational and informative reading are highly useful and important. Reading under adult compulsion with no joy in reading and no realization of its purpose or values is a very poor type of learning activity and usually does not result in the development of either skill in reading or good reading habits. For successful reading practices, the arousal of interest in reading for its own sake is essential. Unless reading is used to satisfy the needs of the child in some direct way, the value of it to him may be very doubtful.

As far as the authors know, seldom if ever have children been consulted as to why they read. An unpublished study by Gladys Hathaway, which is quoted with her permission, throws some interesting light on the question. Children in grades 1 to 8 were asked

to write themes on *Why I Read*. The following are statements made by the children in their own words:

1. Once I began reading because some boy I know was telling me a story. When he was about in the middle (of it) I got so interested I said, "You don't have to read, but will you lend me the book?"
2. You have to learn to read to get somewhere in the world.
3. If you read, the thought that is in the book will get into your head.
4. Reading makes you a detective to see through the world.
5. I read for comfort and pleasure.
6. I read when it rains and I have nothing else to do.
7. I like to read stories that make you laugh.
8. I want to learn to read so I can be a robber.
9. I read to find out what to do.
10. I want to be able to read the notes that my mother writes to the butcher and the baker.
11. So I will be able to read a book like my brother Bill does.
12. When I read on a bottle that it has poison in it I will not touch it.
13. I read to learn about people.
14. I read to know my way on the streets.
15. After going to see an airplane I read about it.
16. I read so I will not be dumb.
17. So my boss won't think I didn't learn when I went to school.
18. Reading is good for your eye strength.
19. If there is an ad in the paper, your dog is lost, then you can read the ad.
20. I read to be happy.
21. I like to read because it controls my mind.
22. If you read an interesting story it makes pictures in your mind.
23. To make teacher happy.
24. Reading takes you through imaginative lands and past history.
25. Reading affords you mind traveling instead of actually doing it.
26. Reading gives you the advantage of learning in a pleasant way.
27. Reading takes you through the life you would like to have lived.
28. Poems even tell me the meaning of life.
29. So I won't have to bother Mother to read to me.
30. To quiet my nerves.

While some of these reasons may sound suspiciously adult, they also give internal evidence of genuineness and reveal some astonishingly precocious ideas among these children. They suggest that if teachers would take care to develop worthy purposes for reading they might be astonished at the results.

The Significance of Purpose to the Teacher. Since the teacher asks or requires that the child read a great deal, it is highly important that through the setting up of situations favorable to reading, through the arousal of interest and purpose, he get the child's co-

operation in all types of activities in which reading is a part. Purposeful reading eventually becomes effective reading. It is particularly important in informational or work-type reading, so common in geography, history, and elementary science, that the child comes to understand what he is reading for, what he is to read, what he is to do with what he reads, and why such reading is desirable. Unless he does understand, work with books may be a very disagreeable and dissatisfying task. Aside from that spontaneous reading which a child does for the pure joy of reading, there are many more serious types of reading into which he must be inducted and in which he must, at least in the earlier stages, exercise his will to persist. Ultimately, however, what he reads must be meaningful and worthwhile to him. He may come to adopt purposes which he himself did not originate. The skillful teacher directs the child in such a fashion that he will rapidly acquire new interests and new purposes which will furnish the impelling force to cause him to engage in reading for its own sake.

Making Reading Interesting to the Child. By inference the preceding section treats of the problem of motivation in many of its aspects. In the past, perhaps, the teacher depended more often upon extrinsic than upon intrinsic motivation. This was because textbooks often contained material of adult rather than of child value. As long as the makers of readers did not consult the interests and needs of children, it was necessary to introduce elements into the technique which were calculated to motivate reading. With the change in emphasis to investigation of children's needs and the tendency to set up specific purposes for reading, the need for extrinsic motivation has largely passed. Children now seek to read for information and pleasure, guided by the need for knowledge and for relaxation and enjoyment. In the practice type of lesson it is difficult at times to provide for intrinsic interest in the material, because the attention is concentrated upon some mechanical aspect of reading. Makers of readers are, however, learning to do away with a large part of the extrinsic motivators and to teach skill in the mechanics of reading through the act of reading for specific values to be found in the material itself. Drill exercises are motivated, if necessary, by the challenging nature of the exercises themselves, or the use of charts, graphs, and other concrete devices. The major emphasis is, and should be, upon the value of the reading experience itself.

The Materials of Reading. The subject matter of reading as an act of learning is as wide as the school curriculum and beyond. Primary reading matter ordinarily makes a strong appeal to the child's interest in narrative. Nursery rimes and jingles, folk tales, fairy and animal tales, have long been used to arouse the interest of the child in learning to read. Within recent years, however, makers of readers have been experimenting with nonimaginative, factual prose about contemporary life. While children seem to prefer the story form, it is also becoming apparent that they can be interested in expository and descriptive writing as well. There is a tendency, then, to use a mixed type of material in teaching children to read, and to furnish them with a varied diet of reading material throughout the elementary school and beyond.

Use of Factual Material. Marked emphasis upon teaching children to read more adequately the factual material of their school textbooks has been apparent in the last few years. Tests have consistently shown that pupils who have been trained to read story material exclusively have difficulty in adjusting themselves to factual material such as is met in geography and history. This difficulty is due to differences in vocabulary, structure, style, content, and type of mental reaction required to read such materials. In progressive schools, it is not uncommon to find teachers directing the reading, and teaching the children to read more adequately than before their textbooks in history, geography, and science.

A Wide Range of Subjects Necessary. The range of material which children are asked to read for various purposes is very great. A simple enumeration of the literature available for children would show that folk tales, fairy tales, myths, legends, fables, epics, romances, ballads, poetry, songs, rimes, and jingles of both ancient and modern types are included in their readers. Picture books, adventure and mystery stories, books on history, biography, geography, travel, nature, applied science, physiology hygiene, citizenship, vocations, gardening, and sports are all available for children. Dramatic literature is drawn upon as well as sacred literature. Current events are presented in the form of children's newspapers and magazines. Adult newspapers carry comic and story sections chiefly for children. There is evidence of the intent of writers and publishers to provide material for children in all the major classifications of literature.

Use of Textbook and Other Materials. In addition to the books written primarily for children's amusement and information, there is a vast quantity of textbook material labeled reading, history, geography, arithmetic, nature study, physiology, hygiene, and civics, which the child is often required to read and master as one of the chief activities involved in learning. Many children rarely come into contact with original sources but receive practically their entire knowledge of literature through the medium of the textbook. One of the commonest of sights is to see a child "studying" a textbook in an effort to memorize facts for later regurgitation in a recitation. Subject matter of the traditional kind is contained in textbooks. Many are now trying to bring about a change. They would like to have the child go to books to find things that he needs in order to live his life rather than to have him forced to study books without any clear realization of their values or meanings. It is the teacher's duty to direct the reading of books so that they will have meanings for the child when he attempts to read them. Otherwise verbal memorizing is an inevitable result.

Wider Reading Desirable. Printed matter of various kinds therefore constitutes the material by which the child gains experience vicariously. In the modern school, the senseless memorization of words in books is discouraged. On the other hand, the need for reading is not less pressing than before. While subject matter for the child may consist of experiences of all kinds, reading furnishes one type of experience which is essential in intelligent learning. The important consideration is to furnish the child with a stimulating environment in which the desire to read may be established and the practice of reading may be improved. Skilled direction in reading will encourage the child to read in wider and wider circles. Subject matter includes human records in printed or written form which have been selected for the use of children.

Directing Independent Reading. When children are being directed to books for reading and study, assignment becomes an important consideration. An intimate knowledge of the material to be read on the part of the teacher is obviously often very essential. Stimulation to read through the creating of, or the recognition of, needs for reading is essential. Purposing and planning are essential activities in a good assignment when reading is to be the major activity of the study period.

The assignment takes on various forms in the reading type of learning. In general, there are three types of assignment: (1) the practice type; (2) the recreational type; and (3) the work type.

1. *The Practice Type.* The practice type of assignment occurs when the teacher directs the child to practice to overcome some error or to develop some needed skill. This type of assignment should occur generally only after the child has met some difficulty and discovered an error. An example may be suggested as follows.

Find in the following list of words those words which have the same endings. Write them in columns on your paper.

fall	hair	girl	flow
nice	tall	toy	fine
fair	advice	stall	slow
ball	wall	joy	annoy
mice	boy	whirl	mine

Practice on such lists would lead to a better command of words and improved skill in word recognition.

2. *The Recreational Type.* The recreational reading type of assignment should take the form of a planned activity which is designed for the fundamental purpose of enriching experience and providing the child with recreation of a wholesome sort. Such assignments should be relatively free from specific, hard-and-fast requirements, and should encourage the development of initiative and independence. The recreational reading assignment may often take the form of suggestions for activity rather than of detailed specific directions. In fact, about all the teacher will need to do in such recreational reading is to furnish the material and the opportunity for the child to read. In addition, it is necessary to introduce new materials to children and to seek to develop their interest in new types of literature and reading. The recreational reading assignment may take such forms as the following:

1. Reading to find material for dramatization
2. Reading to prepare for a discussion during the club hour
3. Reading just for fun
4. Reading to entertain others
5. Reading to enjoy a new experience
6. Reading to relax from hard mental or physical work
7. Reading to enjoy beautiful diction, style, and imagery

In fact, there are endless possibilities in the recreational assignment for worthwhile experiences.

3. *The Work Type.* The work-type reading assignment is a more serious and purposeful activity—at least it is more serious in that the reader is here to engage in reading to find information of assumed value for a specific purpose. The teacher of reading should give emphasis to work-type reading in his systematic training periods. Teachers of history, geography, and other subjects must also learn the techniques of assignment for the work or study lesson in reading. The fundamental conditions of a good assignment in this type of reading are:

1. *Clear Objectives.* The child must have clearly in mind in general what he is reading for.
2. *Suitable Materials.* The school must provide interesting factual materials suited to the child's abilities, well organized, illustrated, and indexed.
3. *Skill in Mechanics of Reading.* The child must develop the ability to attack new words confidently and effectively, and to read with rhythmic eye movements and without lip movement. He must have the habit of thoughtful interpretation to succeed in this type of reading.
4. *Effective Direction.* The teacher must be able to direct work-type reading effectively by means of outlines, problems, questions, and suggested activities. The assignment must be specific and definite and as detailed as the stage of development achieved by the pupils demands. Individual differences must be recognized and provided for in the assignment.
5. *Skilled Appraisal.* The teacher must provide tests of comprehension and mastery either of the essay or objective type or both. Self-appraisal tests are desirable. The child must know how well he has achieved, and what remains to be done in order to achieve, desirable results.

Since assignments of the work type involving reading are so considerably a part of what is commonly looked upon as study, attention to improved assignments of the directed-reading type should yield large returns in increased achievement among pupils.

Types of Class Activities. "Recitation" was for a long time literally a re-citation of what the child had learned either by ear or by reading. The chief evil of the recitation of this older type was the meaningless mouthing over of words often unassimilated by the pupil. Literal reproduction of the exact words of the textbook led to parrotlike repetition of meaningless verbal symbols. This type of recitation was the refuge of the lazy or incompetent teacher. Bereft of this type of activity following a study period in which the pupils have read or studied books, what shall the modern teacher do?

There are many types of recitation activities which may profitably follow a study lesson of the book type. Discussion, re-

production, dramatization, demonstration, practice, organization, planning, problem-solving, creative writing and speaking, testing—these and many other activities offer a chance for a great variety of profitable experiences in the recitation or conference period. There is no excuse for the common practice of using the recitation merely as an oral examination exercise with incessant questions and answers. If it is desired to know how well the pupils have assimilated what they have read, that can be learned more economically and certainly by the administration of an objective point test. The recitation, following a work-type reading assignment, should offer an opportunity for the teacher to supplement the text, enrich the meaning of what has been read, clarify the thought of the author, correct wrong impressions gained from the material, test the power of the pupils to think independently, suggest new problems arising from the contact with the material, and stimulate the planning of new activities and new reading projects. Unless the recitation period does these things, the pupil had better continue his study. The periodic remedial work necessitated by the discovery of errors of thought and method in the work of the pupils and specific practice and drill are, of course, also legitimate recitation activities.

The Measurement of Reading. The measurement of reading activities is a complex problem. Simple tests of rate and comprehension present no great difficulties, but the problem is far more complex than that. To get adequate data on the effectiveness of reading, it is necessary to measure vocabulary, comprehension, organization, retention, appreciation, and ability to solve problems through the use of reading material. Comprehension itself is a complex ability, analyzed by some writers into word, phrase, and sentence comprehension. Organization involves among other things ability to find the central thought and the supporting details, to outline, and to summarize. It is an assimilative activity of marked complexity and of great importance in work-type reading especially. Appreciation, again, is difficult to measure, since it has an intellectual, an aesthetic, and an emotional aspect, each of which is somewhat difficult to appraise on account of its subjective nature. The ability to read analytically, to solve problems through reading, and to apply data gathered from reading to new situations involves a thorough training in reflective thinking as well as special reading abilities of a high order. All of these special abilities are subject to measurement.

1. *The Use of Informal Tests.* The teacher needs to be well trained in the making of informal objective tests for the purpose of both diagnosis and measurement of achievement. He must plan his tests not only to measure general comprehension or assimilation of the ideas developed in the material read but also as diagnostic devices which will reveal fundamental weaknesses in reading ability and hence lead to remedial instruction designed to correct and improve the child's power to read more effectively. This program of informal measurement should result not only in mastery of ideas but also in improved reading techniques.

2. *The Use of Standardized Tests.* The use of standardized tests, while desirable and often very helpful, cannot take the place of the many informal objective tests which must be made by the teacher. There are, however, standardized tests which will appraise reading ability quite adequately and which should be used periodically for this purpose. Among the best of the standardized reading tests are the following:

COOPERATIVE READING COMPREHENSION TESTS (Grades 7-12). Cooperative Test Service, New York, 1938.

Vocabulary
Speed of Comprehension
Level of Comprehension

DETROIT WORD RECOGNITION TEST (Grades 1-2). World Book Co., New York, 1924.

DIAGNOSTIC EXAMINATION OF SILENT READING ABILITIES. Educational Test Bureau, Minneapolis, 1939. Intermediate Division (Grades 4-5); junior (Grades 6-9).

Rate of Comprehension
Vocabulary
Central Thought
General Information
Details
Dispersed Ideas
Inferences
Etc.

DURRELL-SULLIVAN READING CAPACITY AND ACHIEVEMENTS TESTS (Grades 3-6). World Book Co., New York, 1938.

Word Meaning
Paragraph Meaning

GATES PRIMARY READING TESTS (Grades 1-2). New York: Bureau of Publications, Teachers College, Columbia University, 1942. Published in three parts:

- Type 1. Word Recognition
- Type 2. Word Phrase and Sentence Composition
- Type 3. Directions

GATES BASIC READING TESTS (Grades 3-8). New York: Bureau of Publications, Teachers College, Columbia University, 1942. Published in four parts:

- Test A. Paragraph Comprehension
- Test B. Predicting Outcomes of Given Events
- Test C. Directions
- Test D. Reading to Note Details

GRAY'S NEW STANDARDIZED ORAL READING CHECK TESTS (Grades 1-9). Public School Publishing Co., Bloomington, Ill., 1922.

NEW STANFORD ACHIEVEMENT (Grades 2-9). World Book Co., New York, 1934.

Contains a good reading test also published in separate form. The test comes in two parts: primary, for grades 2 and 3; advanced, for grades 4-9.

SANGREN-WOODY READING TESTS (Grades 4-8). World Book Co., New York, 1926.

Contains seven different parts measuring different aspects of reading ability.

THORNDIKE-MC CALL READING SCALE (Grades 2-12). New York: Bureau of Publications, Teachers College, Columbia University, 1921.

THORNDIKE-LORGE READING TESTS (Grades 7-9). New York: Bureau of Publications, Teachers College, Columbia University, 1945.

UNIT SCALES OF ATTAINMENT (Grades 4-12). Educational Test Bureau, Minneapolis, 1932.

- Vocabulary
- Comprehension

Sources of Information on Informal Tests. Excellent suggestions for making informal objective tests are to be found in the following:

LANG, A. R. *Modern Methods in Written Examinations*. Boston: Houghton Mifflin Co., 1930.

RUCH, G. M. *The Objective or New-Type Examination*. Chicago: Scott, Foresman & Co., 1929.

RUSSELL, CHARLES. *Classroom Tests*. Boston: Ginn & Co., 1926.

TYLER, RALPH W. *Constructing Achievement Tests*. Bureau Of Educational Research, Ohio State University, Columbus, Ohio, 1934.

It should be borne in mind by the teacher that the test is far more appropriate as an exercise following a work-type or study reading lesson than a recreational lesson. When pupils do serious work, they naturally expect to be tested to determine whether or not they have been effective in their work. Nor do they resent the diagnostic test; but long, laborious tests following a lesson of a recreational type in which relaxation or aesthetic experience has been sought for its own sake are generally inappropriate. This does not deny the necessity of testing the pupils' understanding or remembrance of important characters and events in literature or of measuring appreciation of thought in recreational reading. It is generally better, however, to confine the heavy testing to work-type material of a decidedly important content.

Diagnostic Work. Measuring the ability of children to learn through reading involves the diagnostic measurement of abilities involved in reading. That is most accurately done by means of well-constructed standardized tests, case studies of individual laboratory tests, case studies of individual pupils, and free use of informal teacher-made objective reading tests which may be organized after the models given by good standardized tests—mimeographed or hectographed, and administered as needed. Test exercises, such as the McCall-Crabbe *Standardized Test Lessons*, may be used for practice exercises in the improvement of specific abilities. Some of the modern workbooks⁹ in reading also contain excellent practice material for use by children weak in the fundamentals of reading. Such practice exercises, however, should supplement rather than take the place of reading material in its natural context for the many specific purposes for which reading materials may be used.

STUDY QUESTIONS

1. What is the importance of learning through reading?
2. Describe in a general way the nature of the reading process.
3. What purposes does reading serve in the school?
4. Why is purpose important in guiding the reading of the child.
5. What subject matter is included in the reading activities of the school?
6. What is reading readiness?
7. What are evidences of children's readiness to begin reading?

⁹ Gilmer, Ellen, and Simpson, R. G. *The Development Reading Series*. Minneapolis: Educational Test Bureau, 1940. Designed to develop thought-getting skills on the part of 20 to 25 per cent of pupils in grades 7 through 10 whose reading level is one, two, or three years below their grade placement level.

8. Why is assignment important in activities involving reading?
9. What type of assignment is advisable in connection with work-type reading?
10. What type of recitation activities should follow a study activity involving reading?
11. Why is measurement important following a reading assignment?
12. What types of measurement are useful in appraising the effectiveness of a reading assignment?
13. Summarize the chapter briefly.

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This volume is a compendium of information on the subject of reading.
2. ———. *The Prevention and Correction of Reading Difficulties*. Evanston, Ill.: Row, Peterson & Co., 1936. Chaps. 13, 14.
Presents a good program of prevention and correction of reading difficulties.
3. DURRELL, DONALD D. *Improvement of Basic Reading Abilities*. New York: World Book Co., 1940.
Contains many practical suggestions on ways and means of identifying individual differences in reading abilities.
4. GATES, A. I. *The Improvement of Reading*, Third Ed. New York: Macmillan Co., 1947.
Contains a detailed plan of measuring achievement, diagnosing difficulties, and conducting instruction in reading.
5. ———. *Interest and Ability in Reading*. New York: Macmillan Co., 1931.
Explains and illustrates methods and materials which the author's investigations and studies best support.
6. GRAY, W. S. "A Summary of Investigations Relating to Reading," *Supplementary Educational Monographs*. Chicago: University of Chicago Press, 1925.
Gives an important summary of the results of scientific studies relating to the problems of reading instruction.
7. HARRIS, A. J. *How to Increase Reading Ability*. New York: Longmans, Green & Co., 1940.
Gives a good treatment of remedial reading.
8. MC CALLISTER, J. M. *Remedial and Corrective Instruction in Reading*. New York: D. Appleton-Century Co., 1936.
Discusses remedial and corrective measures in Part II, and reading in relation to the study of content subjects in Part III.
9. National Society for the Study of Education: *Twenty-fourth Yearbook*. Bloomington, Ill.: Public School Publishing Co., 1925. Part I.

- Contains a comprehensive list of reading activities and objectives, as well as an excellent program for reading instruction.
10. O'BRIEN, J. A. *Silent Reading*. New York: Macmillan Co., 1922.
Presents the psychological and pedagogical aspects of reading with emphasis on methods of developing speed.
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Contains a good treatment of the methodology of the reading process, together with reports of actual teaching situations and investigations of theories of reading.
 12. STONE, C. R. *Silent and Oral Reading*. Boston: Houghton Mifflin Co., 1922.
Gives the results of scientific laboratory studies dealing with reading, and shows how these investigations have influenced teaching procedures.
 13. WILEY, J. A. *Practice Exercises in Silent Reading and Study*. Iowa State Teachers College (J. A. Wiley, publisher), 1928.
Suggests over 500 types of specific practice exercises for developing silent reading and study habits and skills.
 14. WITTY, PAUL, AND KOPPEL, DAVID. *Reading and the Educative Process*. Boston: Ginn & Co., 1939.
Contains much information on remedial reading and an extensive bibliography at the end of each chapter and in appendix D.
 15. YOAKAM, G. A. *Reading and Study*. New York: Macmillan Co., 1928.
Emphasizes more effective study through better reading habits, and gives considerable material of a practical character for developing useful habits of study.
 16. YOAKAM, G. A., AND SIMPSON, R. G. *Directed Study and Observation of Teaching*. New York: Macmillan Co., 1934. (Revision in preparation.)
Contains related exercises.

Newer media of teaching and learning, which are a product of the mechanical age in which we live, have recently been made available to the schools. Among those media are silent and sound moving pictures, the still projector, the radio phonograph, the public address system, and the sound recorder. These devices have been enthusiastically received. To some persons they have promised a royal road to learning. To others they represent a valuable supplemental agency which may greatly expedite teaching.

Comenius, Pestalozzi, and Rousseau had visions of a new type of education which made more of nature and less of the printed page. Direct learning through observation was to replace much of the vicarious learning through books. Again the pendulum swings in the direction of a more varied sensory learning in which the eye and ear will employ new pictorial and verbal devices which, on account of their peculiar properties, may aid the learner to see from inside a bathysphere, or through slow motion and microphotography to watch the most minute processes of plant and animal life.

The reaction against stale and unprofitable verbalism in our schools has again set in. What are the advantages and the uses of these new media of teaching and learning?

The Need of Visual and Aural Aids. The need of these supplementary aids of instruction is much more urgent in the school which is organized along conventional lines than it is in the so-

called progressive school. The latter type of school is much better prepared than the former to offer a program of student activities involving visual and sensory techniques. However, the traditional type of school can make effective use of these aids. Some schools are already installing the sound moving picture equipment as well as the radio. It will be only a matter of time until most schools will be equipped with the latest visual and aural devices.

The effectiveness of these supplementary devices as an aid to instruction, particularly the sound moving picture, is well established. This fact has been demonstrated in the findings of a number of research studies during the last decade. Rulon's¹ study in particular shows that the sound picture in science teaching is an effective technique when employed to supplement the material of the textbook. It reports a 20 per cent gain in pupil achievement and a 38 per cent greater proportionate retention of subject matter over a period of weeks as the result of using the sound film. Charters,² summarizing the Payne Fund Studies, claims that second and third-grade children, at the end of six weeks, will remember 90 per cent of what they knew on the day following a moving picture show. Three months after seeing a picture, they will remember as much as they did six weeks after seeing it. Very young children tend to remember correctly 50 to 60 per cent of what they see.

There are numerous other studies of recent date which prove the value of employing visual and aural aids in the classroom, but it is not practicable to refer to all of them in this discussion. The interested student will want to consult such magazines as *Educational Screen* from time to time.

Precautions to Observe. The emphasis which is now being given to pictorial and sound devices to improve instruction will doubtless invite some adverse criticism if certain precautions are not observed in their use. It will be easy to lose sight of the real purpose of visual aids in the classroom. They are not to be regarded as primary means for the promotion of teaching and learning. They are merely accessory means to these ends, and do not replace reading and study in the process of obtaining information. Their real value in educational practice is most apparent when they are

¹ Rulon, Phillip Justin, *The Sound Motion Picture in Science Teaching*. Cambridge, Mass. Harvard University Press, 1933.

² Charters, W. W., *Value of Motion Pictures in Formal Education. Payne Fund Studies*. New York: The Macmillan Co., 1933.

employed to supplement other activities in learning. They should not be used promiscuously without due regard for their appropriateness in learning.

Their Integration with Learning. To be effective, visual and aural aids must be integrated with children's learning activities. This means that they should not be used merely because they are strange and interesting devices, but rather because they enrich and improve the child's understanding of some important subject, process, or activity. A sound-recording of a speech made by our President is a more effective device in history than a cold reprint of that same speech when the purpose is to create a more lifelike situation. The use of the aural or visual aid should be appropriate and accomplish some significant end. The accomplishment of this purpose requires considerable care in organizing the materials for instructional and learning purposes. It seems reasonable to assume that certain visual aids and techniques may be coordinated effectively with the types of learning to which reference is made in the following paragraphs.

The Use of Visual-Auditory Aids in Sensorimotor Learning. Sensorimotor learning may be defined as that type of learning in which the response is primarily muscular or overt. Since handwriting is the one school subject which falls in the category of this type of learning, it will be used to illustrate how visual aids may be integrated with the learning of sensorimotor habits and skills.

The nature of the desired response in motor learning, being much more evident than it is in the purely mental type, is much less difficult for children to attain. But in an activity as complex as handwriting, in which there occurs a large number of coordinated movements, the use of visual aids is often helpful in enabling children to distinguish the appropriate responses to be made. Ordinarily it is not difficult for them to gain control over some of the large general movements in handwriting, such as the arm and shoulder movements, without the use of visual aids. But even these movements are easier to comprehend when photographed and projected on the screen for observation and study by the writing class.

It is, however, the finer movements of the fingers and wrists which require clarification by photographic analysis. While it may not be practicable at present in many schools to employ visual aids to reveal the nature of these more delicate movements in handwriting, there is reason to believe that, when sensory equipment is

available in the schoolroom, increased use will be made of it by trained teachers.

It has now been more than a score of years since handwriting charts and scales became popular with many teachers, and they are still the most adequate devices for aiding children to recognize their errors in spacing, alignment of letters, letter formation, and legibility. But the specific acts in the process of actual writing, involving control over the finger and wrist movements, require the use of photographic analysis for the diagnosis of children's writing difficulties and the application of carefully devised practice exercises for their improvement. This fact has been quite conclusively disclosed by research in handwriting during the past quarter century. Freeman's investigations³ of the handwriting movements of children in the fourth and fifth grades, in which the study and analysis of form, speed, and the general process of handwriting was made by means of a moving picture camera and projector, proved exceedingly helpful because it clarified the nature of many writing movements which children are unable to recognize although they make them themselves.

Several phases of the learning of handwriting movement may be aided materially by the use of certain sound devices. In separating handwriting movements into desirable units, it seems advisable in the early stages of learning this skill to count, or to have sound instruments do the counting, while having the children write. The phonograph may be satisfactorily employed for group practice and the dictaphone for individual improvement with certain children who have difficulty in following ordinary instructional techniques. Likewise, in the grouping of letters and in gaining the smooth and easy movements from left to right, children may improve in these respects by writing to the beat of a metronome or to the sound of some other device for marking exact time intervals. When appropriately integrated with the act of handwriting, aural aids are invaluable for use in organizing habits and skills.

Visual-Aural Aids in Informational Learning. Informational learning may be regarded as that type of learning in which the response is primarily mental and is conditioned by the ability to read or hear effectively. The reading of almost every kind of material, such as biography, history, geography, and, in fact, prose of almost every

³ Wood, B. D., and Freeman, F. N., *Motion Pictures in the Classroom*. Boston: Houghton Mifflin Co., 1929.

description, as well as maps, charts, graphs, and statistical tables, falls in this category of learning. It is the method by which most people obtain their information, and it is most effectively analyzed, in one of its aspects, by means of photographic records of the eye movements. The fact that the reader's eyes are physical organs through which he gets the meaning from the printed page makes it important to analyze eye movements in order to ascertain whether they are effective or not. To accomplish the analysis effectively, the ophthalmograph may be used. It is possible by means of this mechanism to record the development of several aspects of eye-movement habits; namely, the number of eye pauses or fixations per line, the duration of the pauses, and the number of periods of confusion or refixations, as well as the coordination of the two eyes in reading. These habits are directly related to the quality of reading, and their improvement is conditioned upon the organization of a program of reading and study based on the findings of photographic analysis.⁴ Silent reading as a method of informational learning is, therefore, dependent upon the development of good eye-movement habits, and these require the effective use of visual aids and techniques for improvement.

Since oral reading is also a means of informational learning, it too may be analyzed by a recently perfected device called the eye-voice camera, by means of which records of the eye movements and the voice may be photographed on the same film.⁵ The voice performance is made permanent by having a phonograph record cut at the same time that the eye movements and the voice are recorded on the moving film. Teachers of oral reading and speech may look forward to a time not too far distant when some similar device as the eye-voice camera will be improved to record the breathing performance of the reader and speaker along with the voice and eye-movement records. When these diagnostic devices are generally available in the schools with their accompanying remedial aids, such as the metronoscope and other visual devices of a remedial character, the classroom may become a laboratory as well as a reading and study room.

Other aids for the improvement of informational learning are the silent and sound moving pictures and the ultra-short-wave

⁴ Taylor, Earl A., *Controlled Reading—A Correlation of Diagnostic Teaching and Corrective Techniques*. Chicago: University of Chicago Press, 1937.

⁵ Tiffin, Joseph, and Fairbanks, Grant, "An Eye-Voice Camera for Clinical and Research Studies." *Psychological Monographs*, Vol. 48 (1937), pp. 70-7.

broadcast. But these visual and aural aids are not within the ability of many schools to provide because of their initial costs. Furthermore, the problem of articulating and integrating them with instruction is still in its infancy and remains, therefore, to be adequately solved. The process of electrically transcribing radio programs and then broadcasting them at appropriate periods when classes are in session may be the most practical way of integrating schoolwork with the local radio programs. This is a matter that will call for a certain amount of experimenting. No one knows what improvement in school broadcasting may result in the next few years. The radio seems certain to find a place in the classroom as an aural aid to informational learning.

Audio-Visual Aids in Affective Learning. This type of learning may be defined as that in which the response, whether motor or mental, is accompanied by a pleasant feeling tone. It is largely an emotional reaction. The same principles which govern motor and informational learning also apply to affective learning, but the emphasis is different. In this type of learning it is the attitude of the learner that is important. A favorable attitude may often be developed by the appropriate use of descriptive scenes with their accompanying visual and sound effects. In literature, particularly in ballads and songs, as well as in art and music, affective learning is predominant. These subjects provide abundant opportunities for developing appreciation through the proper articulation of aural and visual aids with instruction. The phonograph, the sound picture, and the radio are familiar examples of instruments which are now employed to aid the development of appreciation of music. Of these aural aids, the radio, for the time being, is least well adapted for classroom instruction. It may require some adjustments of the school program to bring about the proper coordination of local radio broadcasts with school activities if they are to serve a useful purpose in learning. This presents a challenge to school administrators.

The Motivating Function of Visual and Aural Aids. The proper selection and use of these aids often makes an otherwise dull recitation an interesting activity for the pupils. Teachers who have used them in their classes will attest this statement. Those teachers who have not used them in their classes do not realize how valuable these devices are to motivate learning as well as to clarify ideas which may otherwise be very confusing to the pupils.

At their best, many devices of motivation are temporary; that is they serve to arouse a glowing interest, and then their interest-holding power either decreases or ceases to exist. Visual and aural aids may be employed for their own sake, but it is not always desirable to do so. Their interest-getting and holding power is at its best when they provide an experience which aids in solving some problem or in illuminating some subject. When so used, these aids have more than temporary interest value.

There are two characteristics of visual and aural aids which make them highly motivating supplements to teaching and learning. In the first place, many of them are novel to the pupils; they represent a new and an attractive way of encouraging learning without the unpleasantness of many restrictions of the conventional classroom. Second, visual aids are objective, and therefore offer advantages of learning by direct sensory contact. They make things real or at least make them appear real, even though they are produced by an illusion. This concrete touch which is given to learning by sensory techniques increases not only the rate of comprehending information but also its retention over a period of time.

Much relearning is doubtless made necessary because of the opportunities for making errors created by the exclusive use of words as a means of conveying meaning. This condition may be overcome in part by substituting the presentation of data directly through visual sensory aids. At least the beginning stages of a learning activity may be made easier and freer from errors if visual and aural aids are used to give reality to the many things which the pupils are expected to learn. However, it must be remembered that concrete or objective learning cannot continue indefinitely as the principal means employed. Sooner or later, symbolic learning will become the predominant way of obtaining wide knowledge of the world, both near and remote. Reading extensively is usually regarded as the most economical way of getting a broad experience and it cannot be wholly cast aside for either direct contact or pictorial substitution.

Instructional Use of Visual and Aural Aids. If the great value of visual and aural aids is to be realized, it is essential that the teacher learn to use those aids effectively in the classroom. They cannot be used carelessly or indiscriminately without losing their effectiveness as instructional devices. Their selection and adaptation for

instructional use will depend upon the needs and interests of the pupils, their previous experiences, and the type of material or activity to be demonstrated.

Visual and aural aids must be attractive and provide a real medium for learning useful information. If they cannot be made to arouse a feeling of need for learning, they may be used to supplement some important activity which will provide such a need. But whenever possible they should stimulate the desire to know, and arouse an interest in continued independent learning. Specific illustrations of how this may be done, may be observed in the examples relating to handwriting and the observation of eye movements in reading cited in a previous part of this chapter.

Visual and aural aids should be related to pupils' experiences. If they are so strange as to be difficult to understand, they will lose much of their effectiveness in the early stages of learning and interfere with rather than facilitate the initial learning activities. On the other hand, if they are too simple, they may be regarded too lightly by the pupils, and the result will be just as detrimental to learning as if they were too difficult.

Naturally the alert teacher will observe these conditions with the experimental attitude, and make necessary adjustments to the age and interest levels of the pupils when it is practicable to do so. It is to be remembered that techniques and devices of all kinds which have not been validated through years of use in the classroom, will require critical analysis and evaluation to make them most useful aids to teaching and learning.

There probably is no better way to promote active participation in the recitation than the proper preparation of the pupils for the study activities which precede group work. Too much emphasis cannot be given to the value of visual and other sensory aids in the assignment. There are, of course, certain precautions to be observed in doing this. Some aids can be more advantageously used to display types of subject matter than others. Some kinds of materials, for instance, can be best presented by the still projector, photograph, stereoscope, and similar devices, whereas other kinds of materials may be presented best by the silent or the sound motion picture.⁶ Frequently these aids can be employed to supplement each other. However, care must be taken in using them in this

⁶ McKown, Harry C., and Roberts, Alvin B., *Audio-Visual Aids to Instruction*. New York: McGraw-Hill Co., 1940.

way, for it would be uneconomical to use one kind of visual or aural aid when some other kind would be more practical in preparing the pupils for the assignment and the subsequent activity of the recitation.

It is a matter of common sense that the mere display of visual and aural devices, or for that matter the mere demonstration of a motion picture, is not enough in itself to guarantee learning. A thing of this kind does not possess any magic power to educate. That much must be made clear to the pupils as early as possible, or they may soon feel that learning is passive, and that consequently little or no effort on their part is necessary.

Still another phase of the recitation which visual and aural aids may be made to serve is to summarize what has already been presented in the class either in making the assignment or in discussing the subject matter of some previous meeting of the class. A visual or aural review of previously studied material or activity is a great aid to its retention. It becomes a very useful means of summarizing the things which are most important to remember.

Pupil Activity. Visual and aural devices are to be regarded as means to an end, and they will prove most useful when they make learning not only easier but also more effective than is otherwise possible. It would be difficult to justify their use in teaching on any other grounds.

The chief advantage of visual and aural aids is to give the pupils firsthand experience. This means that the pupils should have direct contact with them. Usually the more personal a thing is the more educative it becomes to the learner. Without this personal touch, there is little to be gained in using it to supplement the learning process.

In so far as possible the visual or aural device should be manipulated by the pupils. Of course, there are exceptions to this practice. Some devices are too complex to be handled by anyone except a skilled operator. But there are many items, such as specimens, charts, models, stereographs, lantern slides, and the like, which the pupils may manipulate with a great deal of enthusiasm and success. They should be permitted to participate in operating such devices as their ability may warrant.

Aside from manipulating the devices or helping to manipulate them, the pupils may engage in many related activities, such as collecting materials, designing, arranging and displaying them,

making sketches, painting posters, photographing objects, keeping records and diaries, writing descriptions, making anthologies, etc.

It is of paramount importance that pupils be given opportunities to create learning activities in which they may learn about objects and specimens in their natural surroundings. This point is emphasized by McKown and Roberts in *Audio-Visual Aids to Instruction*.⁷ They cite an instance of a schoolteacher, who upon showing a specimen of a cereal plant—a stalk of wheat—to 206 seventh- and eighth-grade pupils, and asking them what it was, received the following replies: 54 of the pupils called it by its correct name, 109 had no idea what it was, 27 thought that it was oats, 8 said it was rye, 5 called it barley, etc., and 1 called it a corn-cob. Any one of us might have made the same mistake as the pupil who called it a corn-cob, had we never seen wheat growing or read about it. However, the point is that the pupils must do more than merely look at the objects and specimens if they are to learn from the demonstrations. They must have something definite in mind to observe. They must be taught to see these things in their natural surroundings. Without a purpose for learning something from the object or specimen, it is doubtful whether a demonstration contributes much to improve learning conditions. A visual or other sensory device should help the pupils to learn better and more than it would be otherwise possible to learn. That is one reason for using the sensory device in the classroom.

Materials and Equipment. Much information about things near and remote is gathered by school children vicariously, that is, through books, newspapers, magazines, pictures, storytelling, and conversation. Considerably less information is learned through firsthand experiences except during the preschool years. Sometimes it is convenient as well as advantageous to have pupils learn directly from excursions and trips to local places of interest, but this way of learning has many limitations, and as a consequence, the objects and things which are observed and studied away from the school have to be brought to the classroom for further observation and study. Some of these materials include objects such as a piece of rock or a branch of a tree from some distant region. Others include specimens of small animals and insects which the pupils may dissect and study.

Further materials for study may consist of models of motors, gas

⁷ See McKown and Roberts, op. cit., p. 58.

engines, buildings, the human brain, etc. Then there are maps, globes, diagrams, charts, tables, posters and cartoons, a number of which the pupils may either make themselves or have access to in the library, laboratory, or museum. Some of these materials are designated "flat pictures," whereas others are called "graphic" materials. Usually the stereograph, scenic postcards, and mounted pictures belong in the category of flat pictures. Of these various unprojected pictures, the stereograph possesses a real advantage in teaching for the reason that it presents the three-dimensional illusion, which aids materially in helping the pupils to learn about the size and shape of objects in their environment.

There are also the silent and sound moving pictures which are familiar to every school boy and girl. These visual and sound devices represent other methods of presenting materials in an interesting way for observation and study as well as for entertainment. Although they are familiar to children, it is not generally known by them that these motion pictures possess advantages in learning that are not possible by other devices. For instance, many processes occur either too rapidly or too slowly for the naked eye to perceive their taking place. Examples are the scenes of rapidly occurring events in a football game and the imperceptible growth of very young plants. These processes are revealed to the eye by means of time-lapse photography and slow-motion photography with the aid of the motion picture projector. Microphotography is another means of revealing tiny objects that are too small to be seen by the unaided eye. By this process, cells of plants can be photographed with the aid of a microscope and projected on a screen for the pupils to observe and study.

The phenomenal development of radio makes available a great variety of broadcasting programs. News far and wide may be heard by turning the dial to the proper position on the receiving set. Although many broadcasts cannot be integrated with the school programs as yet, that may occur in the near future. Until then the local short-wave broadcasts will continue to develop and improve for school use.

The phonograph makes possible the use of records for local purposes in both voice and speech correction. For remedial work, locally made phonograph records are becoming quite popular for improving oral reading and speech.

The Techniques Needed by the Teacher. In order to use the modern

aural-visual aids most advantageously, the teacher must learn to manipulate effectively the various instruments. The use of a still projector presents little difficulty, but the motion picture projector and the sound projector require some study and practice. The use of the ophthalmograph (eye-movement camera), the telebinocular, the audiometer, and the sound recorded requires training. It is best for the teacher when the opportunity offers to take a laboratory course in the use of these aids. There is not, however, anything mysterious about the operation of visual and auditory devices that any reasonably intelligent teacher cannot learn. Some teachers who have the mechanical aptitude to use instruments may not require any special training to operate them. They may learn how to use the devices by a careful study of the instructions and with a little practice.

In order that the pupils may obtain the greatest possible benefit from the use of these aids, the teacher must learn how to select, classify, and organize them for use, and present the pictures, graphs, movies, etc., effectively. The presentation should be planned carefully to serve a specific purpose or purposes. A series of stereograph slides properly selected for a geography lesson, a moving picture of the action of plant cells in science, a series of well-selected records in music, may be so presented as to greatly enrich the experiences of the pupils.

Evaluation of Schoolwork. The most objective method of evaluating school achievement is by visual techniques. These include such devices as flat pictures, projection pictures, photographs, and stereographs. Tests may be made for use with these devices in the form of matching, identification, multiple-response, or "true-false" items. Some teachers project "true-false" statements on the screen and have the students write their answers by marking "plus" or "minus" or some other symbol to indicate their answers. The popularity of these tests is so great that they are now being used in the roto sections of the Sunday newspapers.

Having the pupils label the various parts of an object, locating places on the map, or making sketches of something read or heard are other ways of evaluating pupil progress. The still projector offers an excellent method of avoiding the need for mimeographed or duplicated tests for this purpose, and represents an economical device for testing.

Some aural devices such as the phonograph and the dictaphone

may be employed, testing the ability of pupils to sound and to use the voice in speaking. Many schools are now recording specimens of the child's speech for careful analysis and evaluation by the teacher at appropriate intervals. These recordings also furnish a permanent record of the child's language behavior, which may be used from time to time for comparisons to determine his progress in language development.

The many experiments in the use of visual and aural aids for testing purposes suggest the possibility of a wide use of these devices in the future for more economical and accurate methods of appraisal.

STUDY QUESTIONS

1. Why are visual and aural aids receiving great emphasis in educational practice today?
2. What does research reveal as to the value of using these aids in teaching and learning?
3. How is the retention of information and skills affected by the use of pictorial and verbal devices?
4. Why should visual and aural aids not be regarded as methods of teaching?
5. How may photography be useful in the improvement of handwriting?
6. What other skills may be improved through the use of visual and aural devices?
7. How may the learning of information be improved by visual techniques?
8. How may the radio aid in developing attitudes and appreciations?
9. In what ways may visual and aural devices be employed to motivate learning activities?
10. What is an illustration of the use of visual and aural aids in making assignments?
11. What are several visual and aural aids which may be employed to improve classroom instruction?
12. How may these devices be used most effectively in the classroom?
13. How may visual aids be employed to evaluate classroom activities?

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